

ED 030 957

24

EA 002 345

By-Provus, Malcolm M.

The Discrepancy Evaluation Model: An Approach to Local Program Improvement and Development.
Pittsburgh Public Schools, Pa.

Spons Agency-Office of Education (DHEW), Washington, D.C. Bureau of Research.

Bureau No-BR-8-0158

Pub Date 69

Contract-OEC-1-7-000059-0059

Note-107p.

EDRS Price MF-\$0.50 HC-\$5.45

Descriptors-Bibliographies, Educationally Disadvantaged, *Educational Programs, Evaluation Criteria,
*Evaluation Methods, *Models, Program Development, *Program Evaluation, Program Improvement, Speech
Education, *Urban Schools

Identifiers-ESEA Title I

A schema for the evaluation of ESEA Title I and III programs is based upon the view that evaluation should be considered as a process for program development and stabilization. Following a general systems approach and applying management theory, the model includes methods for using evaluation as a program improvement tool, with educational performance regarded as an output produced by the interaction of educational inputs (e.g., students, teachers, and materials) with the educational process. The model incorporates five stages of evaluation: (1) Program design, (2) program operation, (3) program interim products, (4) program terminal products, and (5) program cost. Each stage of the model is explained, and guides to assist in decision making by the program administrator are formulated. A Program Interim Assessment Profile charts the evaluation of a program with respect to comprehensiveness, internal consistency, program compatibility, program implementation, relation of process to outcomes, program effectiveness, and program efficiency. Seven appendixes relate the application of the evaluation model to an illustrative case history, the Standard Speech Development Program, serving 5,000 seventh- and eighth-grade students in 37 qualifying schools. A bibliography of 18 items is included. (JK)

ED030957
A

BR-8-0157
PA-24
OE-BR

THE DISCREPANCY EVALUATION MODEL
An Approach to Local Program Improvement and Development

Malcolm M. Provus, Principal Investigator

1969



U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE
PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS
STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION
POSITION OR POLICY.

Pittsburgh Public Schools

Bernard J. McCormick, Superintendent

EA002345

The research reported herein was performed pursuant to contract OEC1-7-000059-0059 with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

TABLE OF CONTENTS

TABLE OF CONTENTS	iii
LIST OF TABLES	v
INTRODUCTION	1
THE MODEL	8
STAGE I	15
STAGE II	24
STAGE III and IV	27
STAGE V	32
A CASE HISTORY	47
APPENDICES	
APPENDIX A	61
APPENDIX B	71
APPENDIX C	87
APPENDIX D	95
APPENDIX E	101
APPENDIX F	105
APPENDIX G	113
BIBLIOGRAPHY	123

LIST OF TABLES

FIGURE 1	10
Evaluation Stages	
FIGURE 2	13
FIGURE 3	17
Design Criteria	
FIGURE 4	21
Checklist for Internal Consistency	
FIGURE 5	23
Basic Interview Questions for Program Compatibility	
FIGURE 6	29
Achievement Plot--Restricted Growth	
FIGURE 7	30
Achievement Plot--Gradual Growth	
FIGURE 8	35
Inter-Stage Relationships	
FIGURE 9	41
Program Interim Assessment Profile	
FIGURE 10	49
Application of the Discrepancy Evaluation Model	
FIGURE 11	103
Simplified Diagram of Pattern Drills Process	

THE DISCREPANCY EVALUATION MODEL
An Approach to Local Program Improvement and Development

INTRODUCTION

Three years ago in Pittsburgh's Big City Evaluation Conference Report to Office of Education, we wrote, "Title I of the 1965 Elementary and Secondary Education Act may be forgotten as a poverty act but long remembered as the source of systematic self-appraisal in America's schools."

The statement was not prophetic. Useful evaluation theory and practice are no better established in public schools today than they were then. However, the need persists.

In most public school systems, evaluation consists of preemptive applications of quasi-experimental designs and abortive efforts to improve programs which were poorly designed and installed and remain poorly administered.

Ultimately programs will improve only if teachers, administrators, and students in most of America's classrooms become involved in a comprehensive effort to review and improve their own work. Such an effort requires careful study by school staffs of their program operations, a detailed analysis of program inputs and processes, and the verification that programs are in fact operating as people believe them to be operating.

For two and a half years in Pittsburgh a carefully selected staff has been engaged in the construction of an evaluation model. Our mandate was clear: redefine the purpose of evaluation in a manner acceptable to local, state, and federal education agencies and then devise and test an operational evaluation model based on sound theory capable of achieving these multiple purposes.

The Office of Education has for three years been forced to go to the Congress with an annual ESEA report purely descriptive in nature--even though the Hill has constantly asked for information as to program benefits. Many state education agencies have asked: "Is our money being spent wisely?" Local boards of education too have wanted to know about program benefits to children. Clearly, what has come to be known as a product evaluation or a benefits assessment is desired at all levels of government. Those who have attempted such evaluations at all levels have discovered what educational researchers have known for a long time: when quasi-experimental designs are applied to the outcomes of new educational programs, generally no evidence of new program advantages over existing program is obtained.

It was with this knowledge almost three years ago that the Pittsburgh evaluation staff focused on a second major purpose of evaluation: to obtain sufficient information about the operation of new programs to change and improve them in their early stages of planning and installation.

This purpose was more relevant to local than state or federal evaluation needs, but obviously the long-run effectiveness of programs at all levels would be due to the adequacy of their management, their fidelity to program design, and the soundness of the designs themselves. Finally, because of the long development time of new programs, a third purpose arose: the need of local or state officials to make early predictions as to a program's eventual success or failure and to use these estimates as the basis for terminating high failure risk programs.

All three of these purposes are served by the Pittsburgh Evaluation Model.

Clearly, the original purpose of Title I legislation was to increase education program payloads for the underprivileged and to prove it. Before this can ever be possible we are going to have to improve our ability to design, install, and stabilize programs. It is important to note that an improvement in development is not always immediately reflected in performance. For example, in aviation a change in wing design may be ineffective until coupled with increased horsepower. So in education a change in instructional material may be inconsequential until coupled with a new mix of students or a new teaching technique. To estimate the effects of a change in program procedure by looking at product outcomes may be grossly misleading.

We must be able to demonstrate our ability to systematically improve programs which will in the long run result in educational benefits. Some program development work in universities, regional laboratories, and centers goes forward. However, it is obvious that unless massive aid is given to research for program development work, little improvement in benefits will be seen in this decade.

All Title I and III ESEA programs are new programs in the sense that they are new to the school district and to most of the personnel involved. These programs are in a "becoming stage" for staff. Procedures must change with experience. And as procedures change, as the possible and impossible are sorted out, goals change and the product to be evaluated must change.

It is possible to describe America's educational task using the following equation:

$$I(P) = O$$

Where "I" = input, "P" = process, and "O" = output. Outputs are viewed as a function of the interaction of inputs with process. For example, students, teachers, and materials (inputs) interact in such a manner (process) as to produce a change in reading levels (output). The difference between "the goal" of the program and the output of the program $[G-O]$ should be minimized for program success.

One of the major purposes of program development work is to better understand the relationships described by this equation in regard

to any program. As more information is obtained and used as to just what inputs, processes, and outputs are involved, a program becomes better defined, more easily operationalized, and ultimately is likely to be more productive.

What educators must realize is that even after a program is initiated they must update their knowledge of all three elements of the equation. If, for instance, a program manager fails to define how inputs will change to outputs (i. e., process) he may be able to demonstrate that a program has achieved its purposes at a given level of cost, but he will be unable to say what the program was or why it worked. The success of any replication will depend on the administrator's ability to understand and apply the principles underlying a program rather than to reproduce the specifics of that program.

If, on the other hand, he defines process well but fails to adequately define either inputs or outputs he will either have created a program whose cost and prerequisite conditions are unknown and unreproducible or he will have inadequate information as to the full range of outputs of his well-defined program.

In the early design stage of a program, the terms in the equation will normally be minimally defined. As program adjustments are made over time, these terms will have to be redefined at about the same level of specificity. The most common error of the evaluator is to sharpen the definition of one term without making corresponding adjustments in

the other terms. For example, to redefine the process of a reading program by focusing on the quality of student and teacher interaction without giving careful attention to the kind of student affect which will be an immediate outcome of such interaction is likely to lead to error.

An example of such error would be the conclusion that a) the specific interaction process is ineffective, or b) the entire program is ineffective. Corresponding attention should be given to defining such inputs as teacher qualifications for such interaction. Again, if teacher qualifications are not carefully defined as to ability to engage in such interactions, the same conclusions (a and b above) may be erroneously drawn--whereas in fact process and program could be sound and only a change in input might be required to keep this program developing nicely.

On the assumption that new educational programs inevitably change over time and that their design and implementation reflect such change, the job of the evaluator is to see that the definitions of "O," "P," and "I" are continuously revised at the same level of specificity. The task here is to extend the definition of one element to the point where an obvious lag in the definition of the other two elements is apparent. Program development is a function of this kind of leap-frog progress.

The model described here deals with explicit methods for using evaluation as a program improvement tool as well as a means of program assessment. Yet the publication of this Model may outmode it.

The amount of effort, time, and resources needed for a school system to do the kind of ongoing program design work described here should make abundantly clear the dependence of school systems on "canned" programs developed by commercial or non-profit organizations such as the national R & D Centers. Unfortunately only a few people in the government and the centers themselves seem to recognize the kind of program development work and supporting program specifications and standards that are necessary before either Regional Laboratories, Title III Centers, or public schools can move to install and maintain these programs.

The authorship of this report is lost in a welter of staff work done over the last three years. However, special recognition should be given to the work of Judith H. McBroom, Coordinator of Evaluation; Gordon A. Welty, Staff Training Specialist; Mary Jane Duda, Coordinator for Research for Instruction and Teacher Training; Leonard E. Glassner, Research Associate; Esther Kresh, Research Associate; and Richard Fogel, Graduate Assistant.

We would also like to thank Ruth Ryals for her able editorial assistance.

M. P.

THE MODEL

The Discrepancy Evaluation Model described in this report is the result of an attempt to apply evaluation and management theory to the evaluation of programs in city school systems.

There is surprisingly little theory on which to base meaningful evaluation practice. The references which have been most relevant to the work reported in this model are listed in the bibliography at the end of this volume.

Daniel Stufflebeam and Egon Guba have published a number of private papers which make substantial contributions to the understanding of institutional change and growth and provide a theoretical frame of reference for the assessment of change. However, despite the name of an education publication at Ohio State University, Theory Into Practice, there appears to be very little linkage between program evaluation going on in public schools today and the kind of theory under discussion by a few university theorists.

Assumptions

1. Many educational programs, especially federally-funded programs, are installed in public school systems without adequate planning.

2. Given this fact, evaluation should be a process for program development and stabilization, as well as a means of assessment. To accomplish this purpose, evaluation must provide information which decision makers can use to improve, stabilize, and assess programs.
3. Two decision-making audiences exist for program evaluation information. Those responsible for making decisions to improve and stabilize specific programs are the first and primary audience. This audience is composed of all strata of program staff--from paraprofessionals up through the top program administrator. Those responsible for making decisions to retain or terminate various educational programs, that is, decisions relative to the allocation of resources, are the ultimate audience for evaluation information. This audience is at the policy-making level of an entire school system.
4. The involvement of program staff in the process of evaluation fosters commitment to program improvement and a more analytical approach to the program which results in desired changes in staff behavior.
5. Evaluation and decision making are separate, yet complementary, functions. Therefore, program evaluators must maintain their independence of program staff and at the same time assume a non-directive role.

The Stages of Evaluation

Evaluation at its simplest level may be seen as the comparison of performance against a standard. When evaluation is viewed as a process for program development, stabilization, and assessment, as is the case in the Discrepancy Evaluation Model, there are five such relevant comparisons. For convenience, the comparison of each level of performance with an appropriate standard designates an evaluation stage. These relationships are shown in Figure 1 below.

Evaluation Stages

Stage	Performance	Standard
I	Program Design Input Dimension Process Dimension Output Dimension	Design Criteria
II	Program Operation	Program Design Input Dimension Process Dimension
III	Program Interim Products	Program Design Process Dimension Output Dimension
IV	Program Terminal Products	Program Design Output Dimension
V	Program Cost	Cost of Other Programs with Same Product

Figure 1

At all stages, some indicator of performance is obtained which is compared with a standard which serves as the criterion of performance.

At Stage I, a description of the program's design is obtained as "performance" information. This performance is compared with the "Design Criteria" postulated as a standard. Discrepancy between performance and standard is reported to those responsible for the management of the program. At Stage II the standard for comparison is the program design arrived at in Stage I. Program performance

information consists of observations from the field regarding the program's installation. Discrepancy information may be used by the program manager to redefine the program or change installation procedures. At Stage III the standard is that part of the program design which describes the relationship between program processes and interim products. Discrepancy information is used either to redefine process and relationship of process to interim product or to better control the process being used in the field. At Stage IV the standard is that part of the program design which refers to terminal objectives. Program performance information consists of criterion measures used to estimate the terminal effects of the project. At this point in time, if decision makers have more than one project with similar outcomes available to them for analysis, they may elect to do a cost-benefit analysis to determine program efficiency. The "Design Criteria" constitutes a basic assumption on which all other criteria for standards are based. The "Design Criteria" has been defined so as to contain three basic elements, each of which may subsume many variables. These basic elements of any program (as described in a vast "systems" literature) are Input, Process, and Output.

If an evaluation staff is to have the support of the program staff it seeks to evaluate, it must provide visible assistance to the staff

of that organization effecting change. Such assistance must be in a form acceptable to program staff. The only assurance of such acceptability is that program purposes be defined by the program staff and the methods of change be determined by them as well. There must be maximum involvement of program staff in every step of the evaluation process. Further, it follows that there must be continual rapport between program staff and evaluation staff, fostered at the initiative of the evaluation staff and resulting in a continuous communication of affect as well as publicly acceptable verbalizations. The relationships to which an evaluation unit submits itself are binding and pervasive; however, it does not follow that evaluation therefore operates at the discretion of the administrator of the program unit. Evaluation is the handmaiden of program development and quiet counselor to administrators--but it operates in accordance with its own rules and on an authority independent of the program unit.

An organizational paradigm which makes these intricate and demanding relationships understandable is that of an action system which contains a feedback loop. The processing of input is at the discretion of the program unit. The definition of output and the shaping of input are at the discretion of the parent organization. The management of the feedback loop is in the hands of evaluation staff. The feedback consists of discrepancy between performance and standard. There can be no evaluation without discrepancy information. There can be

no discrepancy without a standard; therefore, the first task of any evaluation is to obtain program standards.

A feedback loop of discrepancy information based on standards derived from the program staff will necessarily be of interest to a program staff which has been given responsibility for the success of its program.

The evaluation of any school program, which is already staffed and underway, goes through four major developmental stages of comparison--each of which may deal with input, process, and output.

This process of comparison over stages takes the form of the flow chart in Figure 2.

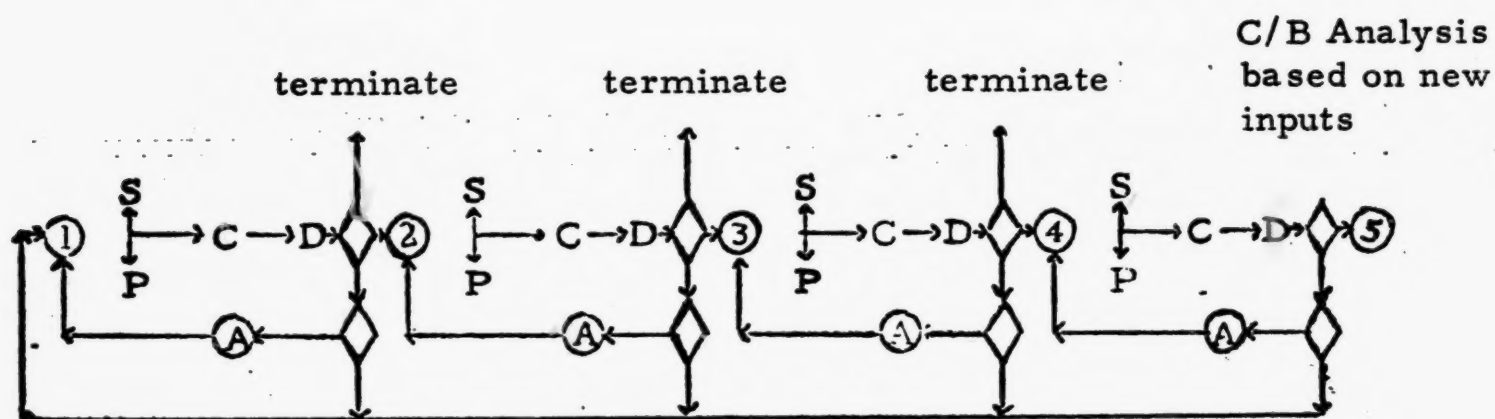


Figure 2

In the chart S = standard, P = program performance, C = compare, D = discrepancy information, and A = change in program performance or standards. Stage V represents a cost-benefit option available to the evaluator only after the first four stages have been negotiated. Notice that the use of discrepancy information always leads to a decision to either 1) go on to the next stage, 2) recycle the stage after there has been a change in the program's standards or operations, 3) recycle to the first stage, or 4) terminate the project. From the program manager's point of view, discrepancy information permits him to pinpoint a shortcoming in the program for one of two purposes: to change the operation of the program, or to change the specifications under which the program operates. A superintendent of schools or board of education will be as concerned with the rate of movement of a project through its evaluation stages as with discrepancy information at any given stage. Generally, the longer it takes to get to stages two, three, and four, the greater the cost if the project fails. The faster a project moves into advanced stages, generally the less the risk of its failure.

Various kinds of performance and standards and the implementation of comparisons will be discussed in greater detail under each stage.

STAGE I

At Stage I, the performance to be assessed is the program design. Experience suggests, however, that with ESEA Title I programs there are usually at least three designs of the program in existence: one is the funding proposal, another is that held by program administrators, and at least one other exists in the minds of program practitioners. The question is raised, then, as to which program design to assess. This question is settled under the model by rejecting inadequate designs and by generating a new dynamic baseline design by means of a group interview with the program staff. This interview takes place at the design meeting.

If the program staff is not too large, all members may be invited to attend the meeting. If it is quite large, a sample of each job type may be selected. The entire group may be divided into smaller groups on the basis of staff level to avoid status conflicts that would inhibit discussion. Or, the groups may contain representatives from all levels. The evaluator structures the meeting to fit the individual program. Whatever the case, all design meetings have these two common ingredients: all levels of program staff are represented, and the larger group is broken down into smaller groups to facilitate discussion.

The purpose of the design meeting is to obtain information which will ultimately become the program design. Prior to the meeting a set of very specific questions is drawn up by the evaluator of the program to elicit this information. These questions are derived from the "Program Design Criteria" shown in Figure 3.

The "Design Criteria" includes a comprehensive list of program elements. An educational program is viewed as a dynamic input-output system with specifications for inputs, process, and output being necessary and sufficient for program design.

By examining Figure 3, it can be seen that every program must specify the variables it seeks to change. These variables will have limits or values set on them to specify the entering levels of students under inputs and another set of values to specify the goals of the program under outputs. For each pair of change variables (that is, for each input-output pair) there is a process to transform the value of the input dimension to the desired value of the output dimension. In defining the process it is necessary to find conditions sufficient to effect this change.

In addition to the change variables, there are preconditions for each program. These designate the resources prerequisite for, but unchanged by, program operation in terms of students, staff, administrative support, facilities, media, and time. As in the case of the

DESIGN CRITERIA

Inputs	Process	Outputs
Variables--the things the program is attempting to change A. Student Variables B. Staff Variables C. Other Variables	Variables--those activities which change inputs into desired outputs A. Student Activities B. Staff Activities 1. Functions and Duties 2. Communication a. Intra-staff b. With Others	Variables--the changes that have come about A. Student Variables B. Staff Variables C. Other Variables
Preconditions--the things that are prerequisite to program operation yet remain constant throughout the program Student Conditions Staff Qualifications Administrative Support Media Facilities Time		Preconditions--same throughout the program
Criteria must be specified for each input variable and precondition above. The criteria specified for student variables and preconditions constitute the selection criteria of the program.	Criteria must be specified for each of the process variables.	Criteria are specified on the variables to define the goals of the program. The participant is released from the program if he achieves the goal of the program or if he violates a precondition.

Figure 3

variables a limit or level is set on each precondition. The combination of the student preconditions and the student variables constitutes the selection criteria of the program. The goals of the program, however, are defined only in terms of the variables. Thus, a student may be released from the program either when he achieves the goal(s), which would constitute a successful completion, or without achieving the goal but by violating a precondition such as the completion of a specific grade level, which would constitute an unsuccessful completion.

Aside from the purpose of gathering information to satisfy design criteria, the program design meeting serves another important function-- that of consensus building. Through the process of give and take that occurs in a discussion group, program staff come to some agreement about their purposes and procedures. In the course of reaching consensus, strong opinions are promulgated and contested, forcing the discussants to think more analytically and carefully about their program and fostering a commitment to the program. The consensus which is generated constitutes the authority for use of the program design as a standard in Stage II.

Once a design has been derived from program staff, activity is channeled toward making the Stage I comparison. The program design (performance) is assessed for comprehensiveness and internal consistency against the "Design Criteria" (standard). The vehicle for conducting the Stage I comparison is a panel meeting.

The panel is composed of those persons who are most involved in and knowledgeable about the program: the program administrator, the program evaluator, a consultant who is an expert in the area of the program content, the Coordinator of Evaluation, and a resource person from the Office of Research who has a background in program design. The panel is the mechanism used to preserve the judgmental function of evaluation and at the same time to reduce the possibility of error by using expert opinion in the formulation of those judgments.

In assessing the adequacy of a program design, there are two basic questions relative to the criterion of comprehensiveness: 1) "Is there specific and complete information for each element of the program design?" 2) "Is the information in useable form?" That is, "Is there an adequate criterion for each of the variables and preconditions?" The answers to these questions will depend on the adjudged face validity of the program design relative to the "Design Criteria." In the case of a disagreement among panel members, the evaluator is responsible for final judgment.

The consultant, on the other hand, has the final authority in determining the internal consistency of a program design. Questions of internal consistency will revolve around the relationships between the various elements in the design. For example, "Are student activities sufficient to change the variables from their input state to the defined output state?" "Is sufficient time allotted to program activities to be able to achieve program goals?" and "Are staff

qualifications sufficient to enable the staff to perform their functions and duties? " In short, internal consistency has to do with the soundness of the design in relating theory to practice. A complete list of questions to be asked in determining the internal consistency of the design is included as Figure 4.

In addition to assessing the program design on the criteria of comprehensiveness and internal consistency at Stage I, the panel also investigates the external consistency of the program. This involves a study of the compatibility of the program with other programs operative in the entire school system. It is essential that programs in conflict with each other be identified. In the absence of explicitly defined system values, the opinions of major staff-- both members of the given program and those who have a more comprehensive view of the system, such as the principal --are solicited. Although judgments arrived at in this manner are indeed gross, it is important to have information about possible value conflicts as to the use of student or staff time, facilities, and media. Problems relating to compatibility are difficult to solve since they often require the ranking of values for the entire system. If any such obstacle to program success is present, it is important to identify it at the beginning.

Checklist for Internal Consistency

	Yes	No
1. Staff qualifications are sufficient for performing staff functions and duties.	_____	_____
2. Staff duties are clearly related to staff functions.	_____	_____
3. The administrative support is sufficient for program operation.	_____	_____
4. Media are related to and sufficient for student activities.	_____	_____
5. Facilities are adequate for program operation.	_____	_____
6. The time allotted for program operation is sufficient to accomplish program goals.	_____	_____
7. At least one of the student variables is a selection criterion.	_____	_____
8. Student activities are related to student goals.	_____	_____
9. Staff activities are related to student goals.	_____	_____
10. A process is defined that is sufficient to change each input variable into the output variable.	_____	_____
11. Communication activities within the program and between the program staff and others are sufficient to support operation.	_____	_____

Figure 4

The evaluator conducts field interviews using Basic Interview Questions for Program Compatibility shown in Figure 5. He presents the findings of these interviews at the panel meeting for review, and is the ultimate authority in making judgments relative to compatibility.

In summary, the purpose of evaluation at Stage I is to derive a design of the program and to assess that design according to its comprehensiveness and internal consistency. In addition, the compatibility of the program within the school system is determined. The standard for making Stage I judgments is the "Design Criteria." The first design of a program is likely to lack specificity and internal consistency, but Stage I procedures provide a mechanism for making it ever more refined and sound.

Basic Interview Questions for Program Compatibility

1. Is sufficient time available for student participation in the program?
What activity does the student give up in order to participate in the program?
Does this reallocation of student time result in sacrifice to other objectives of the school program?
Does it have an effect on the operation and/or goal attainment of this program?
2. Is sufficient time available for participation by the program staff and cooperating personnel?
What activities do staff or cooperating non-program personnel sacrifice in order to participate in the program?
Does this reallocation of their time result in a sacrifice to other objectives of the school program? How does it affect this program?
3. Are facilities and media now available to the program? If not, why are they absent?
Is allocation of facilities and/or media to this program resulting in sacrifice of other objectives of the school program?
Is this program affected by the manner in which facilities and media are allocated?
4. Are the gains for students anticipated by this programs equal to, less than, or greater than possible sacrifices in other educational objectives of the school program?

Figure 5

STAGE II

At Stage II the design, which was the performance at Stage I, becomes the standard against which to judge the program operation. In making the comparison between program operation (performance) and program design (standard), the evaluator proceeds item by item through the program design, considering each item for a congruence test. All statements in the program design are subject to a comparison with what is going on in the field. However, the evaluator bases his decision of which variables to test at a given time on considerations of convenience and knowledge he has gained from the panel meeting as to the possible inoperability of certain design elements. This selectivity is introduced because of the limited resources available to the evaluator. A tradeoff at any given time is effected between those aspects of the program easiest to investigate and those most likely to evaporate. Eventually the evaluator will submit all elements of the design to a congruence test.

The congruence test is facilitated through a series of observations-- some of which may require indirect measurement. All of the usual problems of measurement may pertain here and standard references and techniques are used by the evaluation staff. However, the wise evaluator limits his first round of congruence testing to easily understood referents which have high credibility for the program manager.

In practice, it has been found that a congruence test of "input" elements can and should generally precede a test of "process" elements. After discrepancy information on "input" has been formalized and feedback given to the program manager, a new cycle of "process" congruence testing can be initiated. This latter test is characterized by verification of the existence of process elements. It is not concerned with verifying whether the relationship between input and output due to process does in fact exist. Such a study of causation is dealt with in Stage III.

After each series of congruence tests, the evaluator provides the program manager with the information obtained. If there are discrepancies, the program manager has only two options: he can either modify the design of the program or modify the program operation. We can thus see how the program manager, on the basis of information provided, proceeds to equalize program operation and design.

The question as to the criteria to be used or how much discrepancy is to be considered as inevitable has not yet been resolved under the model. In the absence of a criterion, the procedure used is a group judgment of the same type obtained in Stage I. The panel meeting is called by the evaluator when a first set of elements of the program design has been subjected to a congruence test. Again the consultant brings his theoretical expertise to bear on the subject, and the evaluator

draws on his knowledge of the program design. In addition, where indirect measures have been used the psychometrician is responsible for the construction of instruments, and comments on the validity and reliability of findings. The questions to be answered by the panel are:

- 1) "Is the information on each program element complete? "
- 2) "Is it reliable and valid? "
- 3) "Are the discrepancies uncovered ones which will significantly diminish the program's chances for success? "

The evaluator is the ultimate authority in answering the first question, the psychometrician the second, and the consultant the third.

Through Stage II work the congruence between the program design and operation is continually increased. Such an increase in congruence is what is meant in this model by program improvement. When the panel decides the program is sufficiently stable, a decision is made to move to Stage III.

STAGES III and IV

At Stage III, the first cause and effect comparison is made. The relationship tested is between the variable to be changed (from input to output) and the process or treatment used to effect this change. This relationship, as predicted in the design, is the "standard." The relationship found to obtain empirically is the "performance." Another way of stating this is, does "P" change "I" into "O"? This question is asked in two sequential stages: at the microlevel of specific program process activities producing specific enabling outcomes (Stage III) and at the macrolevel of the entire program or gross treatment producing the anticipated outcomes of the total program (Stage IV). Stage IV adheres to the traditional use of experimental and quasi-experimental designs and is discussed only briefly here.

The purpose of Stage III evaluation is to provide program staff with an estimate of the effect of the process elements (or treatment variables) on the output elements (or dependent variables) as a function of time. In order to accomplish this goal, continuous measurements must be taken both of treatment variables and dependent variables. These assessments result in graphs, which taken together provide a useful description of the process effects on the dependent variables. In order to assess interaction effects, these graphs may be kept for each class and each school in which the program is installed. In addition, a graph should be kept on total program population. The frequency of

the measurements will vary from program to program and will generally be determined by the program staff's assessment of the minimum unit of time it takes to produce a measurable change in the dependent variable. If the dependent variable is achievement in a math text, this unit of time might conceivably be defined as a week's work. If the dependent variable is change in attitude, a measurement might be taken every few months.

In Stage III the initial effects of partial treatment are assessed, further adjustments in treatment are made based on an analysis of interim product data, and greater understanding is achieved of the relationship between treatment outcomes and the conditions of the experiment. At Stage III, the evaluation staff should collect data describing the extent to which student behavior is changing as predicted. Most of this activity is microscopic in nature. Such evaluation depends heavily on the production and use of highly specific instruments that provide empirically determined answers to cause and effect questions. As a consequence of this stage of evaluation, the program staff learns whether or not its intermediate program payloads are being realized on target dates, and if not, why not.

Consider the following example:

A program is installed to improve reading achievement. The primary treatment is an individual tutorial program in which the teacher works with one student at a time while the other students are

engaged in various individual assignments. Suppose, for example, as often happens, a pretest and posttest are administered. The results indicate that the students in this program improve their reading ability no more than similar students in previous years who were not involved in the program. A traditional report would indicate no differences, and program staff would be uninformed as to reasons for the failure. Now consider what could occur under a system of continuous assessment of treatment and dependent variables.

Figures 6 and 7 represent some rather exaggerated but nevertheless possible examples of what the line might have looked like if continuous assessment had been used.

Each time period represents a measurement.

Achievement Plot--Restricted Growth

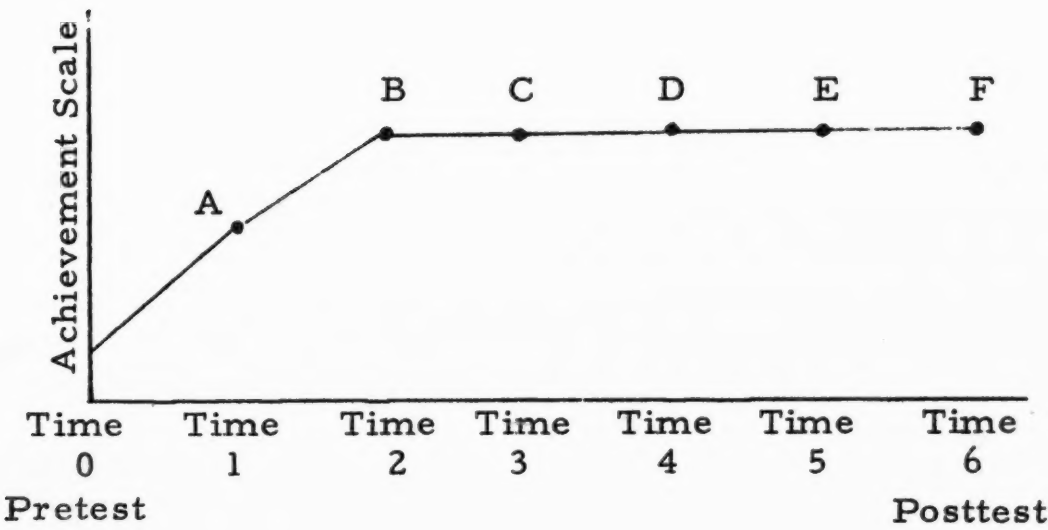


Figure 6

Achievement Plot--Gradual Growth

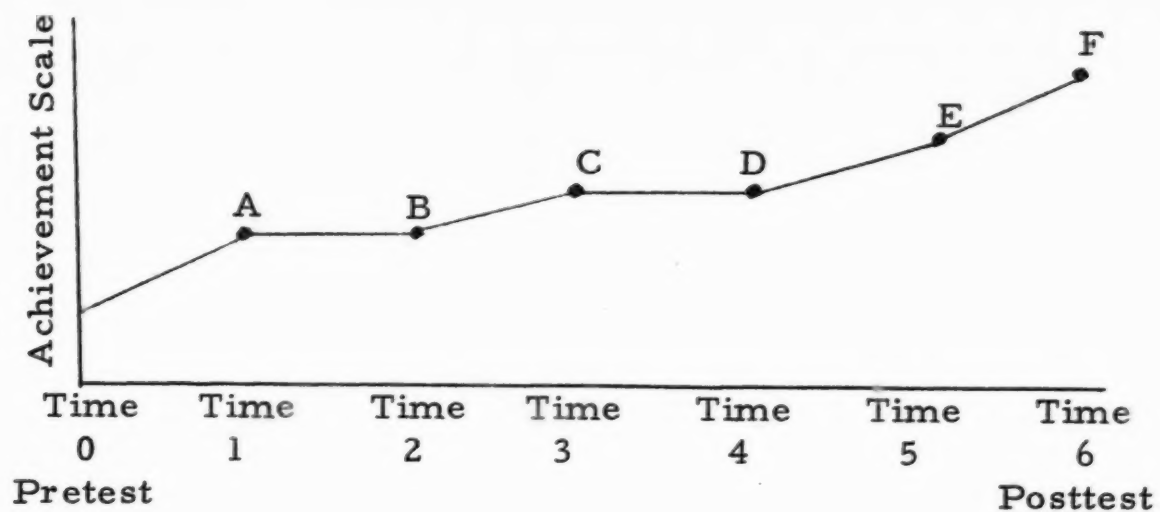


Figure 7

Given these two plots, it would be possible at point C, or at least D, to inform program staff that the amount of time spent in individual instruction has fallen off and no growth in reading is in evidence. Program staff could step in at this point and either change the design of the program or investigate the existence of new variables to be operationally controlled or stabilized.

Finally, at Stage IV the evaluator may cast an experimental design which answers the question: "Has the program achieved its major objectives?"

Stage IV calls for the kind of designs we have long employed in educational research and have more recently employed in error in evaluation. "Employed in error," not because the quasi-experimental designs of the type described by Stanley and Campbell do not belong in an evaluation

strategy, but because they have consistently been used in the wrong stage of a program's development.

There are conditions prerequisite to the use of experimental design in a school setting, and one of the purposes of the early stages of an evaluation is to secure these conditions--just as the early stages of program development form the base on which later program growth may be realized.

In Stage IV, many of the relationships between treatment conditions and effects discovered in Stage III can be properly expressed as independent variables in the experimental design stage. The administrative control secured over the new program in Stages II and III ensures treatment stability. Problems of experimental design, sampling, and instrumentation are more likely to be solved because of increased staff knowledge of factors interacting with treatment.

STAGE V

Having completed evaluations at each stage of the program's development, it is possible to conduct a cost-benefit analysis of the entire program and to compare the results of that analysis (performance) with similar cost analyses of other educational programs designed to achieve similar results (standard). The objective of such comparisons is to determine the most effective allocation of resources. The key to achieving a functional cost-benefit analysis is the extent to which inputs and outputs can be given measurable costs and benefits. If objectives and elements of the design criteria of various programs are given similar quantifiable classifications initially, comparison of cost-benefit analyses is useful.

Cost-benefit analysis normally depends on the establishment of a curve which is a function of benefits relative to costs. Such a curve permits one to relate increments of benefit to cost. The development of such curves goes beyond this model.

It is early in the development of cost-benefit analysis in the public sector to be specific about the procedures to be employed. In fact, at this time, information is simply not available for comparisons across programs. However, cost-benefit analysis is the ultimate rational step in the process of program development and assessment put forth in the Discrepancy Model. In anticipation of its eventual use, the cost-benefit analysis is posited as Stage V.

The Dynamics of Evaluation

Although for purposes of explication the stages of evaluation have been presented above as if they were self-contained and sequential, the real nature of evaluation work is dynamic, with much overlapping and interplay between the stages. This is so because evaluation not only stimulates program development but also must be conducted in light of program change. What occurs, therefore, is evaluation, program change, and reevaluation, allowing sufficient time between evaluations for program change to take place.

In actual practice it turns out that an evaluation requires frequent recycling through those stages which are prior to the stage under negotiation at any point in time. Successive reappraisal of program operations and the program design from which program operations are derived is generally a consequence of the decisions made by program staff on the basis of discrepancy information reported at Stages II, III, and IV. If a decision is made to reformulate program design rather than to revise program performance, there are immediate implications for the renegotiation of all subsequent evaluation stages. Hence, the soundness of judgment of program decision makers and the support they derive from their organizational milieu are of prime importance to evaluators.

This is particularly true of evaluation activity in Stages I and II where major program changes can be expected to occur. When a program is first defined, the design is generally neither comprehensive nor

internally consistent. The panel meeting is then held and problem areas in the design are identified. It is sometimes possible at a panel meeting to resolve difficulties or to fill in gaps from information provided by the program administrator. If so, some changes in the design can be incorporated but a large number of questions remain to be recorded and brought to the attention of the entire program staff at a later date.

Vague and inconsistent as the first design is, there are usually some elements which are specific and complete enough to provide a standard for Stage II congruence testing. After statements in the design have been compared to program operation, the program administrator is supplied with the discrepancy information. (Experiment has shown that at this early stage in program development, discrepancies almost always exist.) He then has two alternatives: to change the design of the program or, as is more usually the case, to adjust program operation through communication of program intent to the practitioners in the field. Whichever the case, some change occurs which, after the time lag for implementation, must then be evaluated.

At this point a second design meeting is often held to obtain needed additional information, to refine existing statements which are not specific, or to restore internal consistency after changes have been made in one section of the design as a result of previous evaluation activity. For example, if the panel meeting made a change in the statement of goals, process would then have to be adjusted to make it consistent with goals.

The second design is usually far more developed than the first. However, if, in the opinion of the evaluator, problems still exist, a second panel meeting may be called. As changes in design occur, more Stage I work is done, program operation is amended, and the process repeats itself until the decision is made (in a Stage II panel meeting) that the program is sufficiently stable to measure initial outputs. Even while Stage III work is being undertaken program operation is being monitored to maintain its accord with program design. Thus, it is necessary to emphasize that not only is the movement through stages not sequential, it is also not linear. The stages of evaluation activity may more accurately be said to occur concurrently and can be represented as shown in Figure 8.

INTER-STAGE RELATIONSHIPS

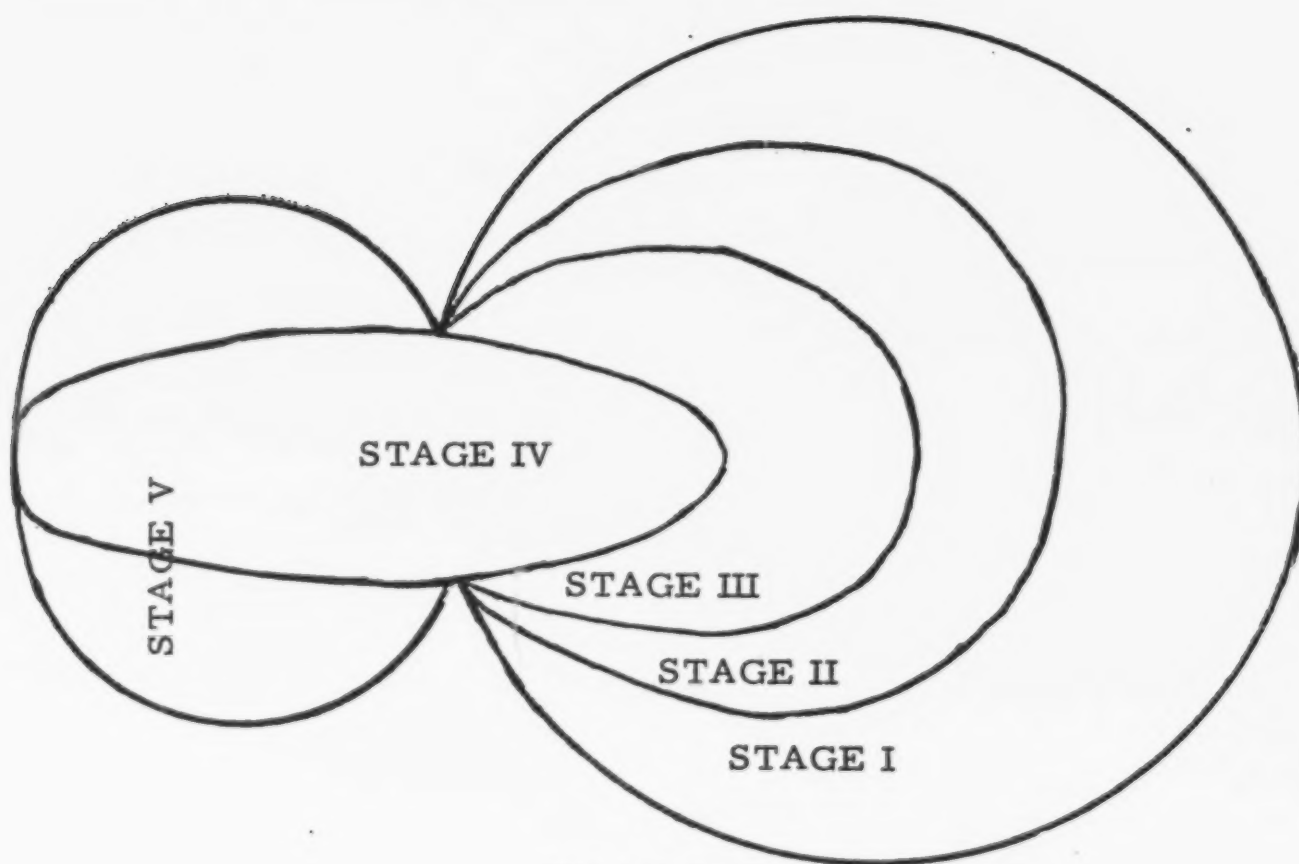


Figure 8

Stage I activity is represented by the largest circle; Stage II then occurs within the context of Stage I work; Stage III work is accompanied by the monitoring of Stages I and II; Stage IV is accompanied by the monitoring of Stages I, II and III; and Stage V work utilizes the findings of Stage IV work for the specific program while overlapping onto the Stage IV work of other program evaluations.

Thus, we see that the process of evaluation is organic and dynamic and grows not only out of previous evaluation findings but out of program change as well. It is a long and complex process, but when the benefits of a stable program can be assessed and then compared to the benefits of other such programs with the aim of determining the most efficient means of reaching an educational goal, the preliminary travail should prove to be worthwhile. The real payload of this elaborate approach is the increased probability of improved programs.

At a more practical operational level, evaluation activity, which is by its nature continuous, is divided into manageable segments called cycles. The cycle begins with a plan which includes a group of questions immediately relevant to the demands of the evaluation of a particular program and sets out the procedures to be used in answering those questions. After a cycle of evaluation has been conducted which includes the entirety of Stage I, any additional cycles will include questions pertaining to more than one stage. At the completion of a cycle, a cycle report is discussed with the program

administrator. This verifies the requirement that evaluation provide information for decision making.

Information for Decision Makers

As stated in the assumptions, those responsible for making decisions about one or more programs are the first and primary audience for evaluation information. The types of feedback given may be characterized as formal or informal.

After each cycle of evaluation activity, members of the program staff are provided with formal feedback in the form of a cycle report. The report contains information about the problems in program design or operation which require adjustments. The evaluation function is not seen as providing a solution or alternate solutions to the problems, but rather as presenting problems based on discrepancy information. The evaluation model represents a method for dealing with these problems.

The cycle report is always given to and discussed with the program administrator, who has the courtesy of a preview of each written report before it is issued. Since it is assumed that all strata of program staff have some decision-making powers, the criterion used in further distributing reports is whether a given group or level of staff can make decisions to affect program change on the basis of given information. Thus, if the findings concern only teacher activities, the report is distributed to teachers, but not to paraprofessionals. In addition, reports are

distributed to adults in the system, regardless of whether they are members of the program staff, who have contributed to evaluation findings.

Feedback of the informal type is provided to program staff by the evaluator who interacts almost continuously with both administrative and field personnel. The degree of interaction is determined both by the size and scope of the field to be covered and by the number of scheduled activities. Program activities such as in-service training meetings and group planning sessions, as well as scheduled evaluation activities, provide opportunities for informal contacts. The evaluator seizes every opportunity for communicating recent evaluation findings. The timeliness of feedback is important. Thus, it is provided as promptly after each set of evaluation activities as is consistent with care and accuracy of data handling and may be presented in oral form while written reports are in preparation.

The crucial factor in a program's ultimate chances for success is the receptivity of the program administrator to evaluation information. The first evaluation efforts with a program may produce a vague design and serious discrepancies between design and operation. However, given the program manager's cooperation and sufficient time, these problems can be solved. On the other hand, another program may have a much superior first design and fewer discrepancies between design and operation. In either case, if the program manager is not receptive to information

provided, the program will not mature to the point where a product evaluation is tenable.

The program administrator's ability to utilize evaluation information is a second aspect of the program's chances for success. It may be that the administrator is not sufficiently analytical to devise solutions to problems identified in findings or that he is simply overwhelmed by them. Or, it may be that the source of the problem is simply beyond the administrator's control and is a problem of the system. This is the case with insufficient budget allocations or variation in program implementation due to conditions in the schools.

The ultimate audience for evaluation information is at the policy-making level of an entire school system. Although providing information to this audience may appear to violate the relationship established with the first audience, the fact remains that policy makers need evaluation information in order to make rational decisions to retain or terminate programs and to allocate resources among them.

As a great deal of time is required to implement all of the evaluation stages described here, policy makers of the school system will ask for information relevant to a program's chances for success prior to the completion of the evaluation. They will want indications of risk before the program product has been measured and a cost-benefit analysis performed. The provision by the evaluation staff of such information may irreparably damage cooperative staff relations painstakingly built by the

evaluation staff. However, the decision to jeopardize evaluation staff work must be at the discretion of the chief school administrator.

Generally, information on program risk is requested by policy makers. This information is provided to the policy makers by the evaluation staff through use of the Program Interim Assessment Profile shown in Figure 9. This profile provides information as to the program administrator's amenability to program improvement and receptivity to discrepancy information. This amenability to improvement is measured by the number of changes in the program relative to the number of evaluation reports he has received.

The Program Interim Assessment Profile is based on seven criteria of program adequacy. Three of these criteria--"Comprehensiveness," "Compatibility," and "Internal Consistency"--relate to the adequacy of program design and have already been discussed at length under Stage I of the Model. "Program Implementation" is a summarization of all Stage II discrepancy information, and "Relation of Process to Outcomes" is a summarization of all Stage III discrepancy information. The last two criteria are not based on evaluation staff work. "Program Effectiveness" information deals with the adequacy or importance of program outputs in terms of the changing goals and values of a school system, and "Program Efficiency" asks whether the purposes of the program are of sufficient value to warrant the use of resources identified under the design of program as necessary to achieve program outputs.

PROGRAM INTERIM ASSESSMENT PROFILE

Age of program _____

Age of evaluation _____

Number of previous cycle reports _____

Factors	Information Available from Evaluator* (A)	Number of Previous Mentions in Cycle Report** (B)	Criteria Level of Performance*** (C)		
			Low	Median	High
1. Comprehensiveness					
2. Internal Consistency					
3. Program Compatibility					
4. Program Implementation					
5. Relation of Process to Outcomes					
6. Program Effectiveness (Adequacy)					
7. Program Efficiency					

* Compute (C-B) values only if a "yes" appears in this column.

** 0=0, 1=1, 2=2, 3=3, 4=4.

*** Low = 0, Median = 1, High = 2.

Risk of failure equation: $(C_1 - B_1) + (C_2 + B_2) + (C_3 + B_3) + (C_4 - B_4) + (C_5 - B_5) + (S - C) + [(C_7 - B_7) (3)]$ = signed value=index of risk

(Negative = High Risk)

(Positive = Low Risk)

Figure 9

An interim assessment of program is achieved by substituting information needed to satisfy Program Interim Assessment Criteria called for in factors 1 to 6 into a risk of failure index equation shown at the bottom of Figure 9. The profile provided in Column "C" and the information or lack of information in Column "A," as well as the response to factor 7, are considered by the decision maker in forming a judgment as to whether a program should be continued or terminated.

The formula calls for a comparison of program performance with the number of times information has been reported for each factor in the profile (C-B). Factor 6, program efficiency, calls for some kind of determination of cost relative to the value of service being rendered. Some index number of value of service ("S") is used such that where "S" is equal to "C" (cost) then benefits are of appropriate value. If "C" exceeds "S" then a negative term is added to the equation. The risk of failure index should not be interpreted too literally. The formula is merely a convenient way of comparing and reviewing pertinent information relative to each program in a system.

One other important aspect of providing information to decision makers is communication. All audiences entitled to evaluation information are relatively unfamiliar with the terms and concepts of evaluation work of this type. Although evaluation activity such as design meetings and informal contacts provides a kind of in-service training for staff, the effort must be made to communicate with program staff at their present level

of understanding and sophistication. It is incumbent on the evaluation staff to do this successfully. Evaluation findings must, therefore, be presented as concisely and clearly as possible--concisely to ensure that they are read and clearly to ensure that they are understood. Although the time-consuming task of searching for the right word for the right place may be a source of frustration to the evaluation unit, it is imperative. Evaluation findings not read and not understood are not used. Technical information is generally reported in state and federal annual reports.

Staffing for Evaluation

Evaluation of the type described above requires the following categories of staff:

1. Administrator (capable of maintaining high quality in research activities)
2. Evaluator
3. Editor
4. Secretary
5. Data handler
6. Consultants in subject areas of programs being evaluated
7. Consultants in instrument development and research design
8. Data processing specialists

In the list above, the staff mentioned in numbers 1 through 5 are regular members of the evaluation unit. The consultants and the data

processing specialists are necessary adjuncts to, but not part of, the evaluation unit.

Thus, it can be seen that the evaluators are non-technicians who have access to specialists or experts as they are needed. The person responsible for the quality control of the evaluation activity acts as a liaison between evaluators and consultants.

In Pittsburgh, evaluators come from a wide variety of disciplines: anthropology, economics, education, English, mathematics, psychology, sociology, and even the ministry. Almost all have graduate degrees. Since no one person possesses all the skills needed to conduct this type of evaluation work, the two most important factors in considering applicants are flexibility and the ability to do analytical or critical thinking. It is felt that flexibility will permit the evaluator to adapt to the varied demands of the job and that his ability to do analytical thinking will be an asset in understanding and implementing the model. In-service training is provided throughout the year as the staff needs it.*

The job of the evaluator is varied, but may be described as containing the following functions: planning, quantifying behavior, data collection and analysis, report writing, and small group leadership.

Under the planning function, the evaluator is administratively responsible for the evaluation activities conducted with respect to his assigned

* A compilation of evaluation training documents is available from the Office of Research, Pittsburgh Board of Education.

program or programs. The fewer the programs he is responsible for, the more work gets done in each and the possibility of frequent feedback is increased. From experience in Pittsburgh it has been found that an evaluator can efficiently handle only one or two programs at a time.

The evaluator plans and executes each cycle of evaluation activity for his program(s). It is helpful, in this respect, if he knows something about problem analysis and has command of various management techniques such as flow charting, block diagramming, and PERT.

As a quantifier of behavior, the evaluator should be able to design simple instruments such as questionnaires, interview schedules, observation schedules, scales, and checklists. Once instruments have been devised, the evaluator must not only employ accepted techniques in collecting the data but must also conform to the conventions established for entrance to and work in schools. The evaluator should be conversant with, though not necessarily an expert in, methods of data handling and analysis.

The evaluator needs to understand group process and techniques of group leadership. He must also be able to relate to program administrators and field personnel for exchange of information and interpretation of findings. The relationship with the program administrator is crucial to the acceptance and use of evaluation information.

Under the reporting function the evaluator must be able to write

reports in standard research format and terminology (for federal requirements) and to write reports in lay language and format (for the two local audiences). Although he may have the assistance of an editor in the latter task, it is primarily the responsibility of the evaluator to assess the level of understanding of his program staff.

Finally, the evaluation unit works as a team. Not only does the evaluator have the administrative responsibility for the evaluation activities in his program(s), he also assists other evaluators in conducting design meetings, data collection, and other activities. The evaluation unit meets at least once a week to conduct routine business, to critique each other's work, for in-service training, or to bring the collective wisdom of the group to bear on particular problems. A spirit of openness and candor obtains as the group shares learning experiences and work problems.

A CASE HISTORY

Standard Speech Development Program

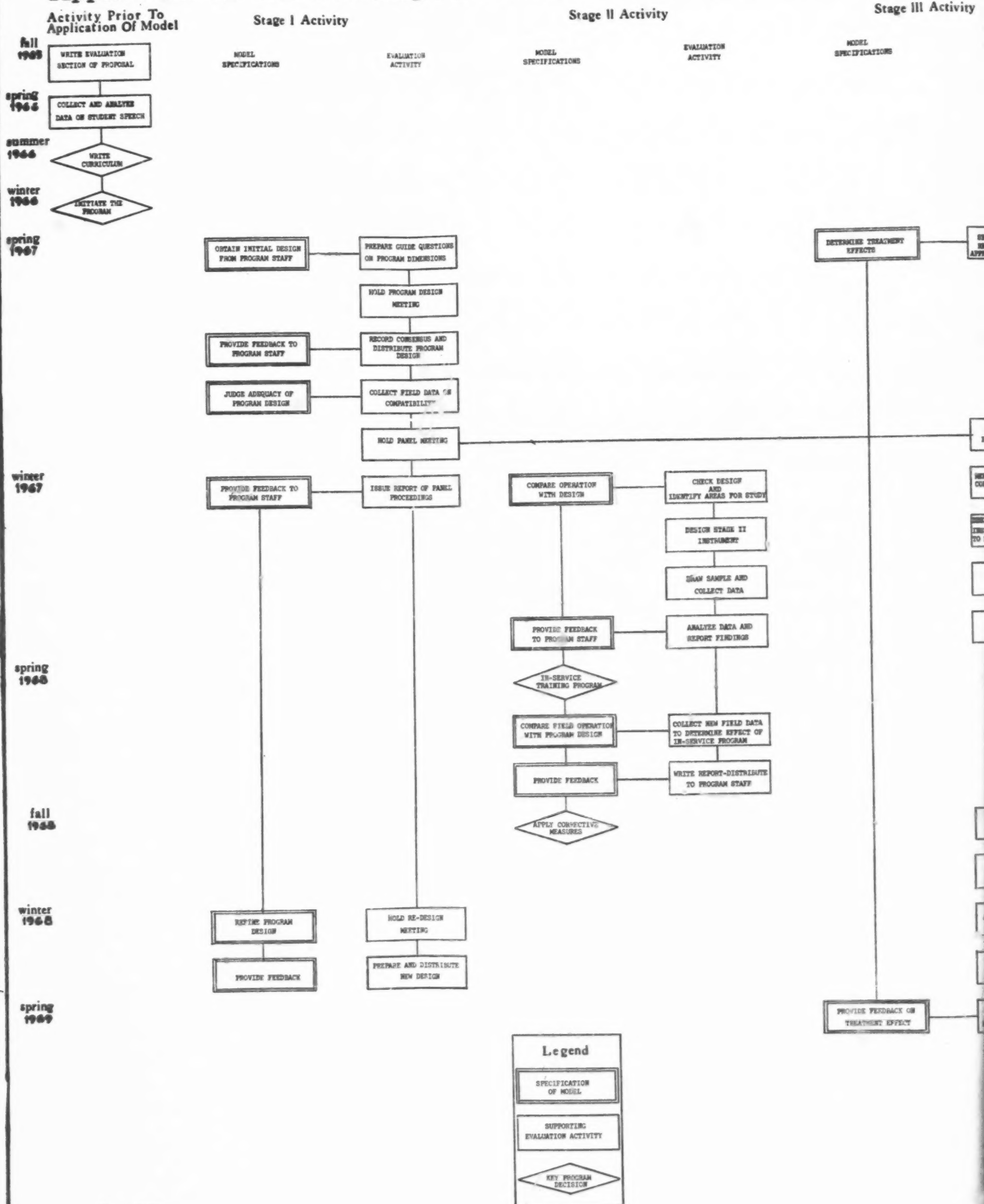
The Standard Speech Development Program, formerly called the Pattern Drills Program, was originally designed for seventh- and eighth-grade students in poverty neighborhoods in Pittsburgh. It now serves approximately 5,000 students in 37 qualifying schools, and is taught by 92 teachers as an integral part of the regular English curriculum. The recommended procedure calls for a 10- to 15-minute daily drill on a particular phonetic or grammatical structure of standard spoken English. In the program the use of non-standard speech is in no way discredited. On the contrary, its preference is conceded for many daily situations in the students' lives. However, it is realized that success in middle class social and business activities requires control of that standard language which serves as the currency of communication in the larger world. Pattern drills were therefore developed to equip adolescents with the phonetic and grammatical structures which will enable them to achieve this control. With this rationale the program qualified for federal funding under Title I of the Elementary and Secondary Education Act of 1965. Initial planning began in that year. The evaluation staff of the Office of Research did not become involved in the program until it was already underway. Once this involvement had become a fact, program and evaluation activity began to influence each other. At this

point the interaction between curriculum and evaluation development which is detailed in this report began. Figure 10 shows the sequential progress and interrelationships of program and evaluation development through the various stages prescribed by the evaluation model.

The first step in evaluating the program was to determine whether a design existed in accordance with the design criteria. The evaluation staff assumed responsibility for seeing that this was done. The evaluator prepared a set of questions to be used as the basis for a program definition meeting. Nine of the 13 teachers who were teaching pattern drills at that time accepted an invitation to participate in a half-day session in which they would derive the basic design. They were randomly assigned to one of two discussion groups. In addition to the teachers each group included two administrators or supervisors from the central office who were actively concerned with the planning and instructional aspects of the program.

A day or two before the meeting the evaluator oriented two discussion leaders--both members of the Office of Research--briefing them on the background of the program and mapping out a general procedure for conducting the groups and recording the proceedings. It was decided to use the circular response technique, in which each participant has a chance to make a statement in his turn; the reason for this strategy being that no one can dominate the entire discussion and that each individual has an opportunity to get his thinking into the record.

Application Of The Pittsburgh Evaluation Model To The Standard Spee

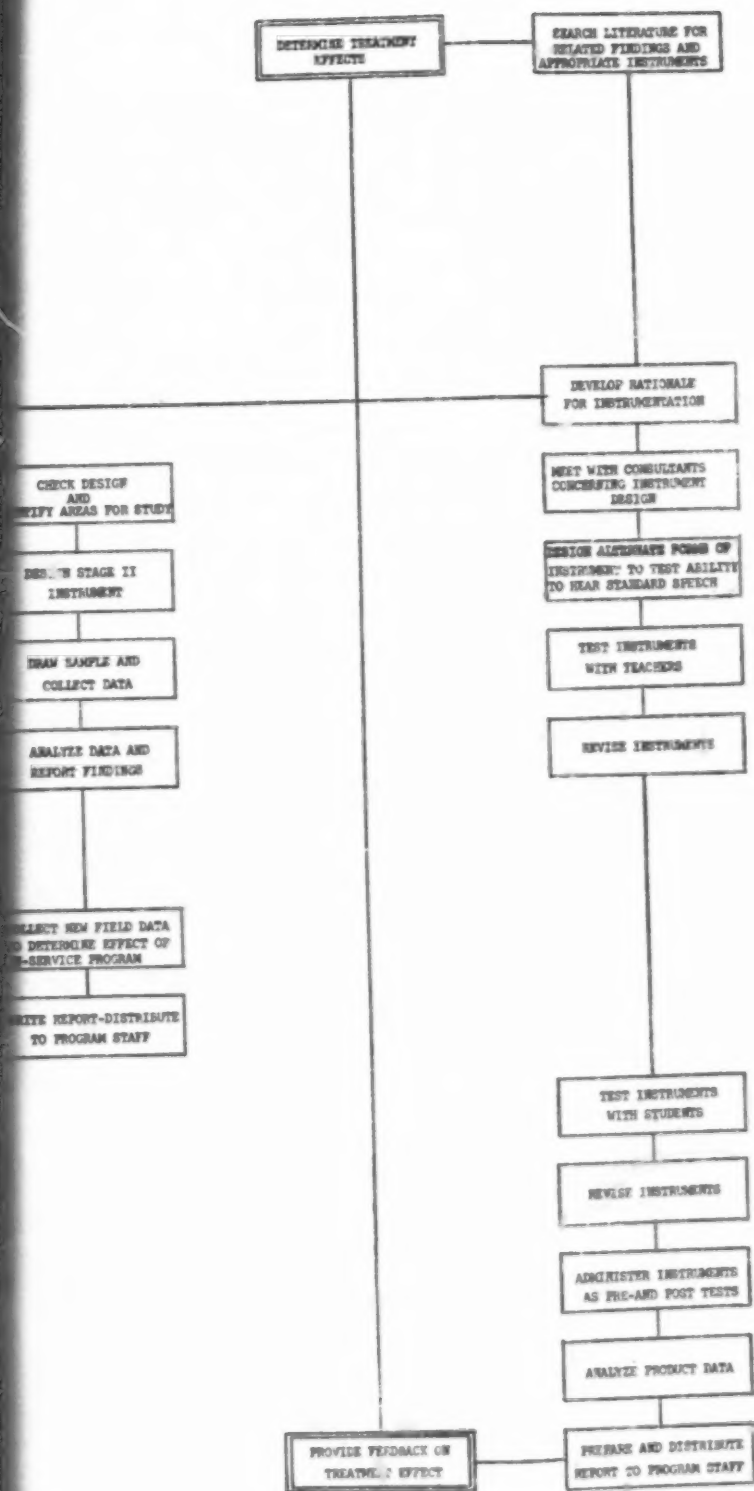


To The Standard Speech Development Program

Stage III Activity

Stage IV Activity

EVALUATION ACTIVITY MODEL SPECIFICATIONS EVALUATION ACTIVITY MODEL SPECIFICATIONS EVALUATION ACTIVITY



Board Of Public Education
Pittsburgh, Pa.

Office Of Research

On the day of the meeting the evaluator appeared to assume a secondary role. He opened the meeting and greeted the participants, attempting to dispel some of the anxiety that seems to be in the air when people who don't know one another too well are getting ready to take part in a new kind of activity. He introduced the staff from the Office of Research, outlined the overall plan for the morning's work, and identified the discussion leaders. He then directed the participants to their assigned tables. From that moment until almost the very end of the meeting he receded into the background and became a careful observer--on call in case of an emergency or breakdown in the discussion, but otherwise a silent partner in the enterprise.

A description of the discussion between groups and the interaction of participants is enlightening. Despite the random assignment of individuals, each group took on its own unique characteristics. One of the groups was much more open than the other, with each participant willing to take his turn, eager to comment and respond to the leader's non-directive guidance. The other group seemed noticeably less secure. New teachers shied away from making comments whenever possible, and looked to their more experienced colleagues to give them clues. Even more noticeable was the difference made by the presence in this group of the program director. Although not known as an authoritarian figure, she was obviously perceived as the ultimate decision maker. Even the

older teachers in this group tended to look to her for significant cues as to her intent, and were generally content to echo her pronouncements. Thanks to the ability of each of the discussion leaders, the data of each of these groups proved to be reasonably similar.

The evaluator's role now became that of a recorder of consensus. By categorizing the responses and fitting them into the broad dimensions of the Output, Input, and Process elements of the "Program Design Criteria," he developed the formal program design. Every member of the Pattern Drills staff received a copy of this design as formal feedback. Appendix "A" contains a copy of this report.

The next step in the evaluation process was to hold a panel meeting so that the adequacy of the design could be assessed. A linguistics consultant served as the technical expert on the panel. The program director and her supervisor represented the program staff. The coordinator of evaluation and the evaluator, joined by a staff psychologist, made up the evaluation component of the panel meeting. For several hours this team put each statement in the program design under the microscope. The evaluator had several responsibilities at the panel meeting. Besides setting up the meeting, he answered questions concerning evaluation of the program and fed into the record a summary of the data on the compatibility of the program with the entire school system that he had elicited from teachers in school visitations prior to the meeting.

Before distributing the report of the panel proceedings, the program evaluator conferred with the program director, explaining the findings in an effort to prepare her for the discrepancy report. With her approval, the proceedings were sent to the entire program staff with an accompanying letter of explanation. This distribution constituted formal feedback. The report is shown in Appendix "B."

We had now completed a full cycle of evaluation, all of which pertained to Stage I activity. Even though, according to the panel, the program was not yet adequately designed, and thus further Stage I work was indicated, the evaluation panel had raised several questions about operations feasibility and had supplemented the design sufficiently to provide a standard for measuring operation. We were now ready for a new cycle of evaluation, which would examine Stage II concerns while at the same time tightening up some Stage I definitions.

The principal source for identifying specific areas of performance to be studied was the program design itself as standard, which the evaluator examined item by item. However, in the panel meeting, there had been agreement that "Outputs" needed clarification. This in turn raised the question as to whether teachers understood the objectives of pattern drills instruction. Similarly, it was clear that time constraints were a probable source of difficulty in the field. In this connection it was noted that the time dimension was closely related to staff functions and duties.

An ad hoc interview instrument for collecting data on these areas of program performance was designed. See Appendix "C." A random sample of pattern drills teachers was drawn, and interviews were conducted in the schools by the evaluator and an assistant from the Office of Research. Analysis of the data revealed the following findings: First, a discrepancy did exist between desired and actual performance in the time devoted to pattern drills instruction. Second, a majority of teachers thought that the drills should not be taught as often as the consultant had recommended. Teachers explained the discrepancy between wish and fulfillment by stating that other curriculum demands left insufficient time for pattern drills, and that many students, especially in the upper grades, found the content too juvenile to engage their serious attention. Third, teachers were found to be lacking in their understanding of the program's objectives, with 39 percent mistaking inappropriate objectives for legitimate ones.

These findings were reported both formally and informally to the program director. She was willing to take action regarding the confusion over valid and invalid objectives. It is believed that this willingness was one of the factors that led to a stepped-up in-service program for all pattern drills teachers. She questioned the concern over time constraints, disagreeing with the consultant's recommendation that the drills should be taught for at least 10 minutes every day. This difference of opinion, although somewhat ameliorated recently, is still

short of complete resolution. The report containing these findings was distributed to all members of the program staff as is shown in Appendix "D."

Implicit in the Stage II findings of Standard Speech Development was the need to further design the "process" of pattern drills instruction. To accomplish this, the evaluator drew up a flow chart to show how the teaching of the grammar drills on the one hand and the phonetic drills on the other was designed to lead to students' control of standard English speech. See Appendix "E." In this chart the relationships of objectives at various levels of specificity are indicated. This is an instance of Stage II work pointing the way to further Stage I activity in the area of making the program increasingly more specific.

Influenced by Stage II findings, the program director instituted the previously mentioned in-service program for all teachers. A skilled instructor was sent into each school to conduct a half-day workshop in methods and objectives. Her goal was to equip teachers to handle pattern drills with greater understanding and effectiveness. Citing her own experience, she stated that reality did not permit a daily lesson of 10 to 15 minutes. She suggested instead a minimum of three 10-minute lessons weekly.

The in-service program became the focal point for the next cycle of evaluation, which would attempt to measure the effect of the training on classroom practice. Substantially the same instrument was administered

as was employed for the previous evaluation, and the same procedure was used to collect the data. Although respondents were asked virtually the same questions as before, the rationale underlying the data collection had a somewhat different emphasis. The previous interviews were conducted to determine the degree of initial correspondence between design and teacher performance in the field. The second set of observations was designed to examine the effectiveness of an intervening staff training activity on two key program variables--understanding of objectives and time constraints. Indirectly it also provided a measure of the effect of earlier feedback on program operation.

The following findings were noted: The discrepancy between guidelines and practice in time allocation had not been reduced in the period between the two observations. These findings as reported are shown in Appendix "F."

Teachers, not surprisingly in view of the instructor's conception of time requirements, still did not see the need for daily presentation of the drills. Nor were they realizing the reduced time allotment they themselves thought desirable. There was, however, a slight improvement in their understanding of objectives, but not enough to conclude that this was no longer a serious departure from design specifications. The report which provided feedback on this series of evaluation activities listed several alternatives that might improve understanding of objectives

and resolve the time conflict. This report has been discussed with the program director, and has been distributed to department chairmen in the schools as well as other key members of the staff.

Two significant modifications have already been made. First, the program has been markedly contracted. It will no longer be offered in grade nine. As of January 1969 it will be mandated in a maximum of four schools, chosen by the program director on the basis of the availability of skilled instructors and supervision by department chairmen. Second, federal funding has been withdrawn from the program, at least partly because of the discrepancies noted in evaluation reports.

To summarize, several significant curriculum and evaluation developments have taken place side by side as the Standard Speech Development Program has evolved. From the program point of view, to date these developments have been:

1. Proposing the program
2. Writing the curriculum
3. Training teachers
4. Installing the program
5. Withdrawing federal funding and contracting the program

The following evaluation activities have paralleled and influenced the program developments listed above:

1. Deriving the program design

2. Assessing the program design
3. Comparing field operation with design
4. Designing instruments to measure pupil achievement
5. Providing continuous feedback to program staff in accordance with provisions of the evaluation model

This year, 1968-69, Stage III work will begin. The actual application of continuous assessment in the evaluation of a specific program raises specific problems in the area of measurement. Before the appropriate measures can be determined, several definitions are needed:

1. Operational definitions of treatment variables
2. Operational definitions of dependent variables
3. A definition of the intervals of time between measurements

The formulation of all three sets of definitions is the responsibility of the program staff.

In the case of the Standard Speech Development Program, the actual lessons are controlled by a script which the teacher reads. As a function of the amount of time he spends on the lesson, he will use all or only some of the examples, which are all equivalent. Thus, the measurable treatment variables become amount of time and/or number of examples used. The teachers will keep a record of these two variables for each lesson

and these will be averaged over the period between any two measurements of the dependent variable.

The operational behaviors for the dependent variables are:

1. Given a set of sentences, the student can select the sentence which is in standard speech form.
2. Given a part of a sentence, the student can orally produce the complete sentence in standard form.

The forms are such that it is possible to generate any number of equivalent sentences. An achievement test can be constructed testing these two behavioral objectives. Using enough examples, it is possible to divide the achievement test into a number of mini-achievement tests--each of which is equivalent. These can then be used to plot the achievement growth during the year, either separately for each objective, or grouped for both objectives. These tests would be administered at those intervals defined by the program staff. This method permits the continuous assessment of the program during the year, and permits a more precise analysis of the effect of the treatment variables on the dependent variables.

The day of reckoning, represented by Stage IV evaluation, lies somewhere in the future. Accordingly, the evaluation staff has been considering adequate measurement of student terminal behavior. A search of the literature and conferences with consultants made it clear that we would need to develop our own

instruments for the Standard Speech Development Program. Appendix "G" shows one of two instruments under development. It was determined that we would ultimately need to know whether students who had received the treatment could control standard speech and the subsidiary enabling skills on which that control is based. A staff psychologist assigned to the Office of Research has been given the major responsibility for designing and testing the required instruments. It is hoped that validity information for these instruments will be available during the present year.

This brings us to the next cycle of evaluation for the program which will look back to Stages I and II and ahead to Stages III and IV during the current school year.

APPENDIX A

PATTERN DRILLS PROGRAM DEFINITION

General

I. Overall Statement of Objectives and Rationale for the Program

The principal objective of the Pattern Drills Program is to provide adolescents who ordinarily speak non-standard English in all situations with the ability to speak the standard English of Western Pennsylvania when the occasion calls for its use. The rationale for the program acknowledges the place of both non-standard and standard speech.

II. Scope

A. Number of Pupils and Schools Involved

At the end of the 1966-1967 school year, the program served approximately 5,100 students in 20 qualifying secondary schools.

B. The Grades or Ages of Participants

Students served by the program include all those enrolled in grades 7 and 8 in participating schools.

C. General Description of Staff

The staff for the Pattern Drills Program is made up of all teachers of English in grades 7 and 8 in participating schools. Supervision is provided by the Supervisor of English regularly assigned to the schools involved.

61/62/-63-

Outcomes

- I. Major Objectives--the changes that are expected to take place in program participants as a result of their experiences in the program. There are two types of major objectives.
 - A. Terminal Objectives--as a direct result of the Pattern Drills Program, it is expected that students will have the following skills:
 1. Be able to communicate clearly with all speakers of English
 2. Be able to shift automatically from non-standard to standard speech and vice-versa as the situation requires
 - B. Ultimate Objectives--those things which it is expected that the Pattern Drills Program will contribute to its participants in the long run:
 1. Increased job opportunities
 2. Increased self-confidence
 3. Increased opportunity for participation in the activities of middle-class society
 4. Increased enthusiasm for participation and achievement in English classes
 5. Increased ability and willingness to communicate with speakers of standard English
- II. Enabling Objectives--in order to bring about the major objectives listed above, the student must first accomplish several things through the program:
 - A. Be aware of the importance of standard speech in appropriate situations
 - B. Respect the appropriateness of non-standard dialects in specific circumstances
 - C. Be able to produce the sounds and syntax of standard spoken speech

- D. Be able to imitate different patterns of standard English
 - E. Be able to hear and distinguish between standard English and non-standard dialects
- III. Other Benefits--benefits expected to accrue to the community as a result of the Pattern Drills Program:
- A. A general upgrading of the community as its citizens are able to participate increasingly in economic and social activities brought about in part by newly acquired control of middle-class speech
 - B. A gradual elimination of non-standard speech as today's non-standard speakers extend their knowledge and use of standard English

Antecedents

I. Students

A. Selection Criteria

The Pattern Drills Program was in effect in two of twenty qualifying secondary schools from May 1 through the end of the 1966-1967 school year. All seventh- and eighth-grade students in these schools participated, the total number coming to 1250. The only prerequisite mentioned for the program, aside from being enrolled in either the seventh or eighth grade in these schools, was "an understanding of English vocabulary." This sole requirement points up two significant observations:

1. A principal difference between the use of pattern drills in foreign language and standard English instruction lies in the fact that in learning a foreign language the student must be taught to receive as well as transmit the patterns; but in learning standard English the non-standard speaker already has a passive understanding of the patterns to be mastered.
2. Hence, in the present program, total energies can be focused on giving students control of phonological and grammatical patterns with which they are already at least passively familiar. This means that it is not generally necessary to avoid the use of lexical items for fear that they would be unknown to the children. This observation supports the consultant's

previous finding in analyzing the tapes of students' speech that lexical items were "so minimal as to be negligible."

B. Entering Behaviors

The students involved in the Pattern Drills Program, though far from a homogeneous group, have in common many observable characteristics which must be taken into consideration when planning instructional activities:

1. A majority of the students entering the program cannot control standard English.
2. Many students come from homes in which standard English is neither spoken nor accepted.
3. A large number of students feel that they would be ridiculed if they were to use standard English in their community.
4. Some students resist standard English because, in the opinions of others, they fear that its acquisition will lead adults to expect too much of them.
5. Many students expect language instruction to offer them a practical tool for communication.

II. Staff

The most important persons in the Pattern Drills Program are the individual classroom teachers, who must have as basic qualifications the ability to speak standard English and at least minimal knowledge of the purposes and techniques of pattern drills. In addition, they should be enthusiastic and convey a lack of prejudice concerning dialect differences.

III. Support

A. Administrative Support

Teachers look to the principal (and at Westinghouse to the department chairman) to provide the day-to-day support for the program within a school, such as scheduling pattern drills classes to the language laboratory. As for overall city-wide support, the central office staff is expected to provide the materials, funds, and communication necessary to initiate and maintain a successful program.

B. Human Resources--the following persons' services are important to program implementation:

1. The linguistics consultant has the following major roles:
 - a. To develop and explain the philosophy of pattern drills instruction
 - b. To identify the patterns of standard and non-standard speech which are to form the content of the pattern drills
 - c. To help the pattern drills writing committee with the production of the drills
 - d. To demonstrate the techniques of teaching the drills
 - e. To provide analysis and feedback to pattern drills teachers
2. The instructional leader of English at Westinghouse coordinates the program with the larger English curriculum in the school.
3. Other teachers can facilitate the objectives of the Pattern Drills Program by stressing the same structures and pronunciations that are covered in the formal drills.

C. Media--the four most valuable materials and items of equipment and their purposes are the following:

1. The pattern drills, which provide the actual instructional content for the program and assure that a particular pattern is correctly presented with respect to rhythm, continuity, and purity
2. Charts prepared by the Office of Research and the pattern drills writing committee, which are used for motivation and visual cues
3. A tape recorder so that students may hear and evaluate their speech
4. The language laboratory, which effectively aids development of oral language skills

Process

I. Student Activities

The drills prepared for the present program are based on a careful comparison between the grammatical and phonological patterns of the non-standard and standard varieties of English spoken in the Pittsburgh area because it is in this region that the vast majority of the students will live and work. The very nature of pattern drills, which utilize the aural-oral techniques also employed in modern foreign language instruction, leads to two basic student activities:

1. Listening to the standard English sound or grammatical form
2. Repeating the standard sound or grammatical form in a variety of drill practices in large groups, small groups, and individually

Several observations were made concerning the second of the two basic activities listed above:

- a. Each separate drill must be limited to a specific sound or grammatical form.
- b. In order to reinforce and provide for eventual automatic control of the standard pattern, frequent substitution drills are presented in which students concentrate on nonessential substitutions in phrase or sentence content while they are repeating the desired pattern unchanged.¹
- c. Occasional drills are designed for testing, but the main activity for students revolves around using the drills for pattern practice, reflecting the major objectives of the program.

¹For example, in a drill devoted to the standard use of "he doesn't," the students might repeat the following series of sentences, each time focusing their attention on the changing direct object of the verb, while the pattern the teacher wishes to reinforce ("he doesn't") remains constant and seemingly of secondary significance:

He doesn't see the elephant.
He doesn't see the giraffe.
He doesn't see the tiger.
He doesn't see the hippopotamus.
etc.

II. Staff Functions and Activities--the specified functions and specific duties of the pattern drills teacher are the following:

Functions	Duties
1. Teaches pattern drills	a. Motivates student for drills (Method varies with individual drills, teacher, and class) b. Presents drills and guides responses by use of oral and visual cues
2. Plans for coordinating pattern drills with the total English curriculum	a. Allots time for drills within the total English curriculum b. Incorporates knowledge and skills into rest of English program
3. Evaluates student progress	Conducts test drills
4. Serves on writing committee if appointed	Produces drills for classroom use
5. Communicates with others regarding pattern drills experience	Provides feedback to writing committee

B. Intra-staff Communication and Coordination--the following intra-staff activities provide for communication about and coordination of pattern drills:

1. At Westinghouse, teachers are kept informed of developments by the instructional leader of English and the department chairman.
2. There is informal contact among teachers of pattern drills.
3. Meetings are held between teachers and the Associate Director of Instruction for English and the English supervisor.
4. In-service sessions are conducted in the schools and at the Administration Building by the associate director, the English supervisor, and the linguistics consultant.

PROJECT PATTERN DRILLSPage 1

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy OUTCOMES

Specific Dimensions	Program Definition	Judgments
I. <u>Major Objectives</u> -- the changes that are expected to take place in program participants as a result of their experiences in the program A. <u>Terminal Objectives</u>	As a direct result of the Pattern Drills Program, it is expected that students will have the following skills: 1. Be able to communicate clearly with all speakers of English 2. Be able to shift automatically from non-standard to standard speech and vice versa as the situation requires	Because of the many varieties of standard English, the objective as it is worded may not be too realistic. The consultant suggests restatement as "Be able to communicate clearly with those people with whom they come in contact in Western Pennsylvania." There are two separate objectives here: a. "Be able to speak standard speech when appropriate" b. "Be able to shift from non-standard to standard speech when the situations requires"

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy OUTCOMES

Specific Dimensions	Program Definition	Judgments
A. <u>Terminal Objectives</u> (contd) B. <u>Ultimate Objectives</u>--those things which it is expected that the Pattern Drills Program will contribute to its participants in the long run	1. Increased job opportunities 2. Increased self-confidence 3. Increased opportunity for participation in the activities of middle-class society 4. Increased enthusiasm for participation and achievement in English classes 5. Increased ability and willingness to communicate with speakers of standard English	Have criteria been developed for terminal objectives? The program has not made it clear that the schools is not devaluating the non-standard English spoken in the home and the community. These are valid Ultimate Objectives, but might logically be rearranged as follows: 1, 2, 5, 4, 3. Perhaps this is a Terminal, rather than an Ultimate Objective. The concept of "willingness," is not really related to the program's objectives.

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy OUTCOMES

Specific Dimensions	Program Definition	Judgments
II. <u>Enabling Objectives</u> --in order to bring about the major objectives listed above, the student must first accomplish several things through the program:	1. Be aware of the importance of standard speech in appropriate situations	The recording "Our Changing Language" (McGraw-Hill, 1967) could be used to implement this objective.
	2. Respect the appropriateness of non-standard dialects in specific circumstances	This could better be stated as: "Be able to produce the phonological and grammatical patterns of standard spoken speech."
	3. Be able to produce the sounds and syntax of standard spoken speech	This might be more clearly stated as: "Be able to discriminate among the different patterns of standard English."
	4. Be able to imitate the different patterns of standard English	Logically, number 4 should precede number 3, since discrimination precedes the ability to produce a sound or structure.
	5. Be able to hear and distinguish between standard English and non-standard dialects	Some specific examples for clarification and guidance of teachers could be included.

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy OUTCOMES

Specific Dimensions	Program Definition	Judgments
II. <u>Enabling Objectives</u>--in order to bring about the major objectives listed above, the student must first accomplish several things through the program: (contd.)		Program staff may want to determine how these Enabling Objectives are related to desired outcomes and how they can be measured. What are the specific activities for each Enabling Objective?
III. <u>Other Benefits</u>--benefits expected to accrue to the community as a result of the Pattern Drills Program	A. A general upgrading of the community as its citizens are able to participate increasingly in economic and social activities brought about in part by newly acquired control of middle class speech B. A gradual elimination of non-standard speech as today's non-standard speakers extend their knowledge and use of standard English	"Standard" is a more accurate description of the speech referred to than is "middle class." If this concept is internally inconsistent (i.e., in conflict with the program's objectives), it should be eliminated from the definition.

PROJECT PATTERN DRILLS

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy ANTECEDENTS

Specific Dimensions	Program Definition	Judgments
I. <u>Students</u> A. <u>Selection Criteria</u>	The Pattern Drills Program was in effect in two of twenty qualifying secondary schools from February 1 through the end of the 1966-1967 school year. All seventh- and eighth-grade students in these schools participated, the total number coming to 1250. The only prerequisite mentioned for the program, aside from being enrolled in either the seventh or eighth grade in these schools, was "an understanding of English vocabulary." This sole requirement points up two significant observations: 1. A principal difference between the use of pattern drills in foreign language and standard English instruction lies in the fact that in learning a foreign language the student must be taught to receive as well as transmit the patterns; but in learning standard English, the non-standard speaker already has a passive understanding of the patterns to be mastered.	The following could be added: "Students who do not speak some form of English natively are not expected to benefit from the program."

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy ANTECEDENTS

Specific Dimensions	Program Definition	Judgments
A. <u>Selection Criteria</u> (contd.)	2. Hence, in the present program, total energies can be focused on giving students control of phonological and grammatical patterns with which they are already at least passively familiar. This means that it is not generally necessary to avoid the use of lexical items for fear that they would be unknown to the children. This observation supports the consultant's previous finding in analyzing the tapes of students' speech that lexical items were "so minimal as to be negligible."	
B. <u>Entering Behaviors</u>	The students involved in the Pattern Drills Program, though far from a homogeneous group, have in common many observable characteristics which must be taken into consideration when planning instructional activities: 1. A majority of the students entering the program cannot control standard English.	This could be added as the first item under Entering Behaviors: "All students speak some form of English natively."

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy ANTECEDENTS

Specific Dimensions	Program Definition	Judgments
B. <u>Entering Behaviors</u> (contd)	2. Many students come from homes in which standard English is neither spoken nor accepted. 3. A large number of students feel that they would be ridiculed if they were to use standard English in their community. 4. Some students resist standard English because, in the opinion of teachers, they fear that its acquisition will lead adults to expect too much of them. 5. Many students expect language instruction to offer them a practical tool for communication.	It is not made clear that students are concerned with communication outside of the school also. Consideration has not been given to ways of measuring this expectation.
II. <u>Staff</u>	The most important persons in the Pattern Drills Program are the individual classroom teachers, who must have as basic qualifications the ability to speak standard English and at least minimal knowledge of the purposes and techniques of pattern drills. In addition, they should be enthusiastic and convey a lack of prejudice concerning dialect differences.	What are the specific functions and duties of the program staff?

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy ANTECEDENTS

Specific Dimensions	Program Definition	Judgments
<u>III. Support</u> <u>A. Administrative Support</u> <u>B. Human Resources</u>	Teachers look to the principal (and at Westinghouse to the department chairman) to provide the day-to-day support for the program within a school, such as scheduling pattern drills classes to the language laboratory. As for overall city-wide support, the central office staff is expected to provide the materials, funds, and communication necessary to initiate and maintain a successful program. The following persons' services are important to program implementation: 1. The linguistics consultant has the following major roles: a. To develop and explain the philosophy of pattern drills instruction b. To identify the patterns of standard and non-standard speech which are to form the content of the pattern drills c. To help the pattern drills writing committee with the production of the drills d. To demonstrate the techniques of teaching the drills e. To provide analysis and feedback to pattern drills teachers	

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy ANTECEDENTS

Specific Dimensions	Program Definition	Judgments
B. <u>Human Resources</u> (contd)	2. The instructional leader of English at Westinghouse coordinates the program with the larger English curriculum in the school. 3. Other teachers can facilitate the objectives of the Pattern Drills Program by stressing the same structures and pronunciations that are covered in the formal drills. The four most valuable materials and items of equipment and their purposes are the following: 1. The pattern drills, which provide the actual instructional content for the program and assure that a particular pattern is correctly presented with respect to rhythm, continuity, and purity 2. <u>Charts</u> prepared by the Office of Research and the pattern drills writing committee, which are used for motivation and visual cues 3. A <u>tape recorder</u> so that students may hear and evaluate their speech 4. The <u>language laboratory</u>, which effectively aids development of oral language skills	

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy PROCESS

Specific Dimensions	Program Definition	Judgments
I. <u>Student Activities</u>	The drills prepared for the present program are based on a careful comparison between the grammatical and phonological patterns of the non-standard and standard varieties of English spoken in the Pittsburgh area because it is in this region that the vast majority of the students will live and work. The very nature of pattern drills, which utilize the aural-oral techniques also employed in modern foreign language instruction, leads to two basic student activities: A. Listening to the standard English sound or grammatical form B. Repeating the standard sound or grammatical form in a variety of drill practices in large groups, small groups, and individually Several observations were made concerning the second of the two basic activities listed above: 1. Each separate drill must be limited to a specific sound or grammatical form.	"Listening to and discriminating the standard English sound and grammatical patterns (minimal pairs)," would be a more accurate and complete statement of this activity. "Contrast" would be better here than "form."

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy PROCESS

Specific Dimensions	Program Definition		Judgments				
I. <u>Student Activities</u> (contd.)	2. In order to reinforce and provide for eventual automatic control of the standard pattern, frequent substitution drills are presented in which students concentrate on nonessential substitutions in phrase or sentence content while they are repeating the desired pattern unchanged. 3. Occasional drills are designed for testing, but the main activity for students revolves around using the drills for pattern practice, reflecting the major objectives of the program.		The definition might logically be expanded to establish specific connections between Enabling Objectives and Student Activities. How is the time dimension evaluated? In the opinion of the linguistics consultant, not enough time is allotted for pattern drills instruction, nor is continuity adequate to realize the program's objectives. This is seen in the program's present definition.				
II. <u>Staff Functions and Activities</u> A. <u>Staff Functions and Duties with Respect to Specific Positions</u>	<table><tr><th>Functions</th><th>Duties</th></tr><tr><td>1. Teaches pattern drills</td><td> a. Motivates students for drills (method varies with individual drills, teacher, and class) b. Presents drills and guides responses by use of oral and visual cues </td></tr></table>		Functions	Duties	1. Teaches pattern drills	a. Motivates students for drills (method varies with individual drills, teacher, and class) b. Presents drills and guides responses by use of oral and visual cues	What is the relationship between teacher functions and activities and program objectives?
Functions	Duties						
1. Teaches pattern drills	a. Motivates students for drills (method varies with individual drills, teacher, and class) b. Presents drills and guides responses by use of oral and visual cues						

PROJECT PATTERN DRILLS

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy PROCESS

Section of Taxonomy			PROCESS	Judgments
Specific Dimensions	Program Definition			
A. <u>Staff Functions and Duties with Respect to Specific Positions (contd.)</u>	Functions	Duties		
	2. Plans for coordinating pattern drills with the total English curriculum	a. Allots time for drills within the total English curriculum b. Incorporates knowledge and skills into rest of English program		
	3. Evaluates student progress	Conducts test drills		
	4. Serves on writing committee if appointed	Produces drills for classroom use		
	5. Communicates with others regarding pattern drills experience	Provides feedback to writing committee		
	B. <u>Intra-staff Communication and Coordination</u>	The following intra-staff activities provide for communication about the coordination of pattern drills: 1. At Westinghouse, teachers are kept informed of developments by the instructional leader of English and the department chairman. 2. There is informal contact among teachers of pattern drills.		

REPORT OF PANEL PROCEEDINGS

Section of Taxonomy

PROCESS

Specific Dimensions	Program Definition	Judgments
B. <u>Intra-staff Communication and Coordination (contd)</u>	3. Meetings are held between teachers and the Associate Director of Instruction for English and the English Supervisor. 4. In-service sessions are conducted in the schools and at the Administration Building by the Associate Director, the English Supervisor, and the Linguistics Consultant.	

APPENDIX C

PATTERN DRILLS CYCLE II INTERVIEW SCHEDULE

In the continuing development of the Pattern Drills Program it is desirable to determine the viewpoints of teachers at periodic intervals. With this in mind, we are requesting your appraisal of Pattern Drills at this time in terms of your experience with them in your own classroom. The Office of Research guarantees the anonymity of all respondents.

PART ONE - TIME DIMENSION

1. How many times each week do you feel Pattern Drills should be presented in:

Grade 6 _____ Grade 7 _____ Grade 8 _____ Grade 9 _____ ?

2. How many times each week do you ordinarily teach Pattern Drills in:

Grade 6 _____ Grade 7 _____ Grade 8 _____ Grade 9 _____ ?

3. If there is a difference between your answers to Questions 1 and 2, to what do you attribute the discrepancy?

4. How much time do you feel should be devoted to each Pattern Drills session in:

Grade 6 _____ Grade 7 _____ Grade 8 _____ Grade 9 _____ ?

5. How much time do you ordinarily devote to each session in:

Grade 6 _____ Grade 7 _____ Grade 8 _____ Grade 9 _____ ?

6. If there is a difference between your answers to Questions 4 and 5, to what do you attribute the discrepancy?

87/88/89-

PART TWO - OBJECTIVES OF PATTERN DRILLS

A. Which of the objectives listed below do you feel genuinely apply to Pattern Drills? Indicate your opinion by placing a check mark before those objectives you believe pertain to the program. Please mark the check in the first of the two blank spaces that precede the item:

As a result of participation in Pattern Drills instruction, students should better be able:

- | | | |
|-------|-------|--|
| _____ | _____ | To eliminate most gross errors in written composition |
| _____ | _____ | To communicate clearly with all English-speaking persons with whom they come in contact |
| _____ | _____ | To generalize to standard speech forms in contexts other than those presented in the formal drills |
| _____ | _____ | To substitute formal acceptable words and phrases for overused slang expressions |
| _____ | _____ | To spot errors in pronunciation and grammar in the language of their friends |
| _____ | _____ | To use appropriate speech patterns automatically |
| _____ | _____ | To increase their formal vocabulary |
| _____ | _____ | To reproduce the sounds and grammatical constructions of standard English |
| _____ | _____ | To achieve success in the study of a foreign language |
| _____ | _____ | To differentiate between situations for which standard or non-standard speech is appropriate |
| _____ | _____ | To shift from non-standard speech and vice versa as the situation requires |
| _____ | _____ | To instruct their parents and other adults in correct usage |
| _____ | _____ | To speak standard English in all situations |
| _____ | _____ | To overcome noticeable speech impediments not requiring the services of a speech therapist |

B. Now indicate the importance you assign to the objectives you listed as legitimate ones for Pattern Drills instruction by rank-ordering those you have checked. Start with number 1 for the most important and continue until you have recorded a number for all the objectives in this category. Write your figures in the second of the two blanks preceding the objective.

RATIONALE FOR PATTERN DRILL PROGRAM INTERVIEW SCHEDULE

The rationale for administering the attached pattern drills instrument is quoted from the program's cycle II plan, dated January 11, 1968:

<u>PROGRAM DIMENSIONS</u>	<u>QUESTION</u>	<u>RATIONALE</u>
Staff Functions and Duties	How consistently and uniformly are pattern drills being taught? Are all teachers using pattern drills?	... The panel stated that staff duties and functions were not specified in the definition. The first step in specifying duties and functions of the teacher is to determine what he/she is doing in the classroom.
Major Objectives and Enabling Objectives	Are teachers aware of (a) major objectives?	If teachers are to present drills properly, they should be able to (a) state program's overall objectives...

It should be further noted that at a panel meeting on May 3, 1967 the linguistics consultant stated that in order for students to achieve automatic control of standard speech (a key terminal objective), pattern drills should be taught for at least 15 minutes a day. Part one of the instrument will determine to what extent this recommendation is currently being honored.

The data will be tabulated so that separate analyses can be made for elementary school and secondary school respondents.

PROCEDURES FOR ADMINISTERING PATTERN DRILLS PROGRAM INTERVIEW SCHEDULE

Introduction

Before beginning the interview, the interviewer will either ask the respondent to read the introductory paragraph or he will orally explain the purpose of the interview, making the same points as are contained in the opening paragraph.

Part One--Time Dimension

1. The questions on this page will constitute an oral interview, with the interviewer recording responses as they are obtained.

2. Any discrepancies noted between questions 1 and 2 should be summarized in brief anecdotal form in the space below question 3, and any discrepancies noted between questions 4 and 5 should be similarly summarized in the space below question 6. If no discrepancies are noted, write "None" or "No discrepancy."

3. At the top of the page the interviewer will record the teacher's name and school together with the amount of in-service training the teacher has had for pattern drills to the nearest half day.

Part Two--Objectives of Pattern Drills

1. This part of the instrument is a questionnaire, which is to be completed by the respondent in the interviewer's presence.

2. In the first column to the left of the page the respondent will check all the objectives which he considers valid for pattern drills.

3. In the second column the respondent will rank-order the five objectives which he considers to be the five most important, with #1 indicating the highest priority.

APPENDIX D

CYCLE II REPORT PATTERN DRILLS PROGRAM

An evaluation report of the Pattern Drills Program was issued in September 1967. The findings indicated that the program was, in general, compatible with the English program and the overall school program, although there was confusion on the part of teachers as to the relative priorities in the use of class time. The definition of the Pattern Drills Program was found inadequate in four areas. (For an elaboration of these findings the reader is referred to the previous document, Evaluation Report, Stage I, Pattern Drills Program.) Investigation by the evaluation staff has produced no evidence of action by the program staff as a response to these findings.

The current second cycle of evaluation took place during the first semester of this school year. The study was undertaken to determine the degree to which the operating Pattern Drills Program is consistent with the specifications of the program definition.

Program Operation

The evaluation focused on two questions: (1) How are teachers using the drills, i. e., how often are the drills taught and for what length of time at each session? and (2) Do teachers understand the purposes of pattern drills instruction? The findings are presented under separate headings below.

95/96/-97-

Use of the Drills. Using two points of reference, it was found that a discrepancy exists between desired and actual performance in the use of the drills. When actual performance was compared with what teachers themselves perceived as desirable, a substantial number were found who were neither using the drills as frequently as desired nor holding drill sessions of the desired length. When actual performance was compared with the standards recommended by the program consultant, the vast majority of teachers were found not to be performing in accordance with the desired standards.

Purposes of the Program. In general, teachers do not understand the purposes of pattern drills instruction. When they were asked to select "correct" and "incorrect" items from a list of possible objectives for the program, 39 percent of their responses were inappropriate. Many of the "incorrect" choices were statements in direct conflict with the purposes of the program. The significance of this misunderstanding for the effectiveness of the program is pointed up in the following statement by the program consultant: "If teachers are to present drills properly, they should be able to... state the program's overall objectives..."

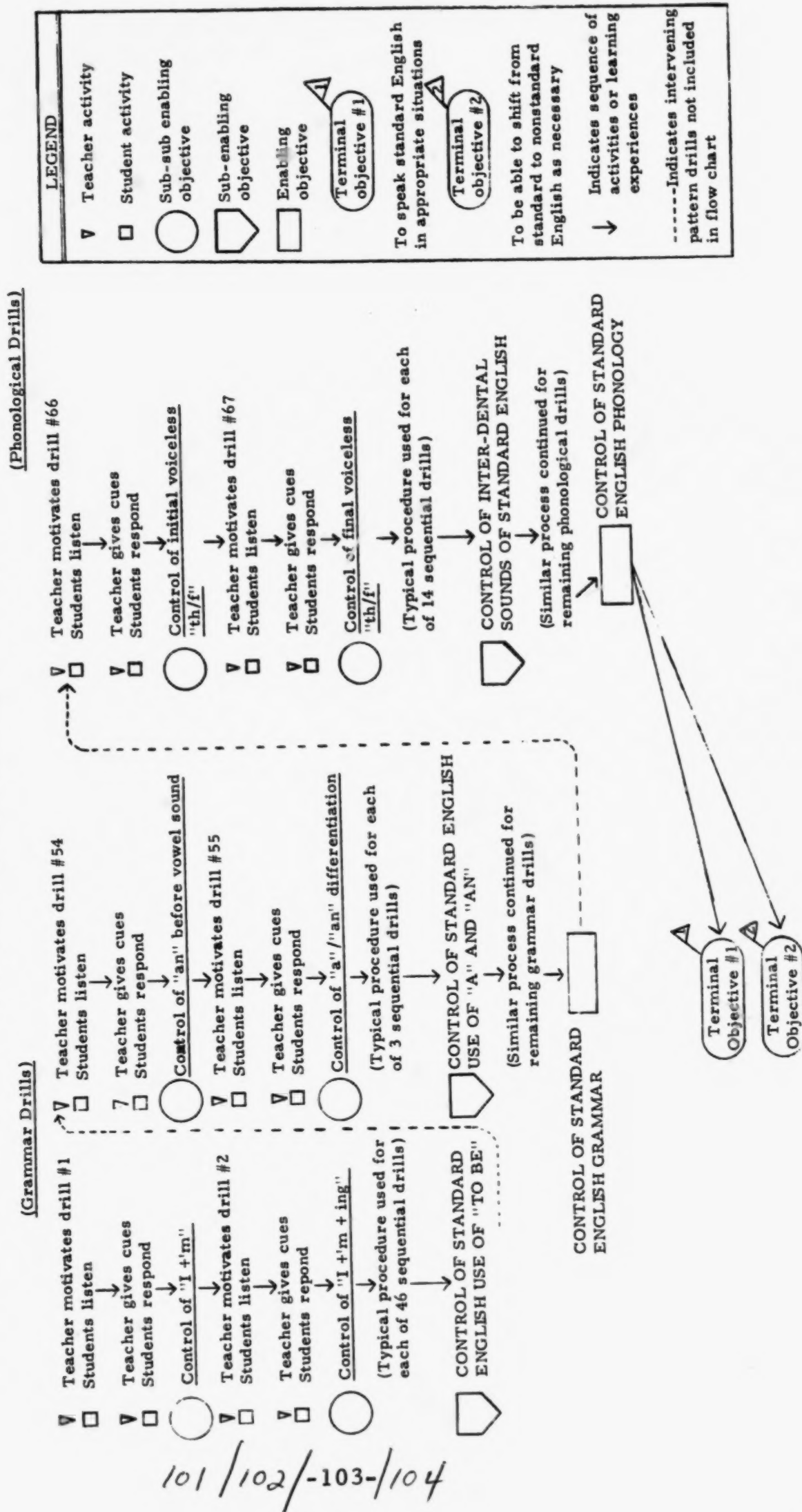
Changes Effected in the Program

Investigation by the evaluation staff has shown that action has already been taken consistent with the findings of the cycle II evaluation.

Beginning in February 1968, a consultant will spend a half day in junior high schools conducting appropriate in-service activities with pattern drills teachers.

APPENDIX E

FIGURE 11: SIMPLIFIED DIAGRAM OF PATTERN DRILLS PROCESS



APPENDIX F

STANDARD SPEECH DEVELOPMENT (PATTERN DRILLS) CYCLE III REPORT

Summary of Preceding Report

The most recent evaluation report of the Standard Speech Development Program,¹ the Cycle II Report, was distributed to staff members in February 1968. It was concerned with two major questions:

(1) How often were pattern drills being taught and for what length of time at each session, and (2) Whether teachers understood the program's objectives. Data collected in January 1968 showed pronounced discrepancies between the time recommended for teaching pattern drills (15-minute sessions per day) and time actually devoted to them in many classrooms (ranging from 0-5 sessions per week of 0-10 minutes per session). The report also highlighted a confusion in teachers' minds concerning the valid objectives of the program. This inability of many teachers to distinguish between valid and inappropriate objectives cast considerable doubt upon the program's successful implementation.

Scope of Present Report

The present document reports the impact of a recent in-service training which attempted to change teachers' understanding of the time

¹ Formerly called Pattern Drills Program

requirements and of the program's objectives. This in-service program was conducted after the issuance of the Cycle II Report. It was conducted in most of the participating schools, and included the majority of teachers in the program. According to the instructor, the training focused on the practical day-to-day operation of the program. In order to facilitate comparison, the same group of randomly selected teachers who were interviewed for the previous study in January were again polled, being asked to answer the same questions. In addition, these teachers were asked for an appraisal of the recent in-service training in terms of its value in enabling them to help students to realize the program's objectives.

Time Allocated to Drills

The serious discrepancy between guidelines and actual practice in the time allocated to the teaching of pattern drills has not been reduced since the preceding report. In fact, the discrepancy may have been accentuated by the in-service activity. In May 1967 the program's consultant recommended that pattern drills be taught for a minimum of 15 minutes every day in order to provide students with automatic control of standard speech. She reinforced this recommendation in a memorandum to the Office Of Research in February 1968, by stating:

...I recommend the use of the pattern drills materials for a minimum of 15 minutes five days a week... The regular daily use of drills cannot be emphasized too strongly, since the immediate goal of developing a new set of language habits depends heavily on regular and repeated practice to establish automatic control.

Nevertheless, confronted with practical considerations as she perceived them, the in-service instructor advised teachers to schedule no more than three five-to-ten minute pattern drills lessons weekly. The following findings of the current evaluation underline the conflict between expert opinion and classroom practice regarding time requirements:

1. Teachers do not see the need for daily presentation of the drills.
2. They fall somewhat short of realizing even the reduced frequency of presentation that they consider desirable.
3. They devote less time to teaching the drills in each succeeding grade.
4. Teachers are more likely to approach the recommended number of lessons per week than the recommended length per session.
5. The two most common reasons which teachers gave to explain the time discrepancy were: (a) Too crowded a curriculum, and (b) A lack of student interest.

Teachers' Understanding of Program Objectives

A slight improvement was noted in teachers' ability to identify the valid objectives of the program (69 percent appropriate responses versus 61 percent in the previous interviews).

However, half of the teachers still saw two spurious objectives as valid: (1) To substitute formal acceptable words and phrases for overused slang expressions, and (2) To overcome noticeable speech impediments not requiring the services of a speech therapist. Further, one-third of the teachers identified two other invalid objectives as authentic: (1) To spot errors in the pronunciation and grammar in the language of their friends, and (2) To increase their formal vocabulary. These findings indicate no substantial change in understanding of objectives as a result of the in-service training.

Teachers' Appraisal of In-service Training

Over half the teachers credited the current in-service activity with helping them to lead their students to realize two crucial program objectives: (1) The ability to reproduce the phonology and grammar of standard English, and (2) The power to use appropriate speech patterns automatically. However, the continued uncertainty of many teachers regarding program objectives is pointed up by the fact that almost one-fourth also stated that the recent in-service training has helped them to accomplish invalid objectives.

Problem Analysis

Several basic problems have characterized the Standard Speech Development Program since its inception. These have been further clarified by this cycle of evaluation.

1. Time Allocated to Drills. In May 1967 the program's consultant recommended that pattern drills be taught for a minimum of 15 minutes per day. However, the in-service instructor advised teachers to schedule no more than three five-to-ten minute pattern drills lessons per week. In practice, teachers are unable or unwilling to schedule pattern drills lessons as frequently as recommended. This problem could be ameliorated by:

1. Realigning the components of the present course of study in English in participating schools to make a definite daily pattern drills lesson possible.
2. Substituting the pattern drills program for large portions of the sections on grammar and speech in the present course of study. The three-track construction of the present English curriculum may make it feasible to effect this substitution for the lower track classes with comparative ease.
3. Modifying objectives by specifying a more limited, less rigorous set of expectations, which would in turn reduce the amount of time needed for the program.

2. Teachers' Understanding of Program Objectives. The data reflect that teachers still do not have a complete understanding of the program's objectives. The seriousness of this is emphasized by the consultant's statement that: "If teachers are to present drills properly they should be able to ... state the program's overall objectives..."

3. Motivation of Students. There is a need to provide teachers with techniques to improve the motivation of students. This need becomes

increasingly imperative in the upper grades, to judge from the teachers' observations that the decreasing amount of time devoted to pattern drills in grades eight and nine is partly due to lack of student interest.

Both improved understanding of objectives and greater competence in motivating and presenting pattern drills may be accomplished by:

1. Intensified in-service training of sufficient duration before teachers begin to teach drills. This training should be designed to acquaint teachers with the philosophy of pattern drills as they relate to participating students in the Pittsburgh Public Schools.
2. An ongoing in-service program during the school year, using demonstration, observation, and supervision tailored to specific classrooms and grade levels.
3. The revision of existing materials to increase the relevance of the content for participating students. Attention should be given to writing new drills to attract the more mature students in the upper grades or to lowering the grade placement for the present program.
4. The preparation of new materials concerning objectives and techniques for teacher reference.

A detailed report of the data and analysis can be found in the forthcoming annual report. Future evaluation will reexamine those aspects of the program considered here and will study the effect of pattern drills instruction on pupil performance as instruments to measure achievement now being developed become available.

APPENDIX G

PRELIMINARY TEST

Aural Discrimination Between Standard and Non-Standard English Sentences.

Narrator: You will hear a statement followed by two comparison statements. On your answer sheets circle the letter A or B identifying the statement which is most like the first in terms of language structure.

Example 1: I ain't got none.
Comparison A: I don't have any.
Comparison B: I ain't got none.

Now circle your answer. (5 second pause)
The correct answer is B. Do you see why?
If not raise your hand.
Here is another example.

Example 2: Dis is worser dan dat.
Comparison A: Dis is worser dan dat.
Comparison B: This is worse than that.

Now circle your answer. (5 second pause)
The correct answer is A. Do you see why?
If not raise your hand.
Now we will begin.

- Number 1: Jane look all right in dat dress.
A: Jane looks all right in that dress.
*B: Jane look all right in dat dress.
- 2: Jim's shirt don't look clean.
A: Jim's shirt doesn't look clean.
*B: Jim's shirt don't look clean.
- 3: The children rided on de bus.
A: The children rode on the bus.
*B: The children rided on de bus.

- 4: John an Susan haven' went ta church yet.
A: John and Susan haven't gone to church yet.
*B: John an Susan haven' went ta church yet.
- 5: At las, de TV man fix de set.
*A: At las, de TV man fix de set.
B: At last, the TV man fixed the set.
- 6: Mary may have come in for the interviews.
A: Mary may have came in for de interviews.
*B: Mary may have come in for the interviews.
- 7: I got no money.
*A: I got no money.
B: I don't have any money.
- 8: He looks like a policeman.
A: He's look like a policeman.
*B: He looks like a policeman.
- 9: It happen again. My car was broke down.
*A: It happen again. My car was broke down.
B: It happened again. My car broke down.
- 10: I waited until they got back, but June and Tom were late.
*A: I waited until they got back, but June and Tom were late.
B: I wait until they got back, but June an Tom was late.
- 11: I try to dance as best I could.
*A: I try to dance as best I could.
B: I try to dance as well as I can.
- 12: The party was not fun. I don't think anything happened.
*A: The party was not fun. I don't think anything happened.
B: De party was no fun. I don' think nothin happen.
- 13: Bob! It looks like the dogcatcher is coming out.
A: Bob! It look like de dogcatcher's comin out.
*B: Bob! It looks like the dogcatcher is coming out.
- 14: He try to acts like de boss.
*A: He try to acts like de boss.
B: He tries to act like the boss.

- 15: This is a nice car.
*A: This is a nice car.
B: Dis here's a nice car.
- 16: Look--there are airplanes in the sky.
A: Look--Der's airplanes in da sky.
*B: Look--there are airplanes in the sky.
- 17: After they win de ballgame they was so happy.
A: After they won the ballgame they were so happy.
*B: After they win de ballgame they were so happy.
- 18: We were talking to some of the teachers.
A: We was talkin to some of de teachers.
*B: We were talking to some of the teachers.
- 19: But maybe some of they are just sad.
A: But maybe some of dem just sad.
*B: But maybe some of them are just sad.
- 20: That's just the name of the song.
A: That jes de name of de song.
*B: That's just the name of the song.
- 21: She bout 16, I guess.
A: She's about 16, I guess.
*B: She bout 16, I guess.
- 22: Are you gonna have a party on Saturday?
A: Are you going to have a party on Saturday?
*B: Are you gonna have a party on Saturday?
- 23: I baby-sitted and made fifty cent.
*A: I baby-sitted and made fifty cent.
B: I baby-sat and made fifty cents.
- 24: When I broked my leg it hurted alot.
*A: When I broked my leg it hurted alot.
B: When I broke my leg it hurt a lot.
- 25: They were so happy we came to the basketball game.
*A: They were so happy we came to the basketball game.
B: They was so happy we come to de basketball game.

- 26: There was three of us at de store.
*A: There was three of us at de store.
B: There were three of us at the store.
- 27: I think they in classroom now.
A: I think they're in the classroom now.
*B: I think they in classroom now.
- 28: She in 2nd grade, but I's in 4th.
A: She is in 2nd grade, but I'm in 4th.
*B: She in 2nd grade, but I's in 4th.
- 29: They're waiting for the icecream man.
*A: They're waiting for the icecream man.
B: They waitin for de icecream man.
- 30: After eatin too much, usually I be sick.
*A: After eatin too much, usually I be sick.
B: After eating too much, usually I am sick.
- 31: I am hungry. I hope there is a candy machine.
A: I is hungry. I hope there be a candy machine.
*B: I am hungry. I hope there is a candy machine.
- 32: If John don't want trouble, they be there.
A: If John doesn't want trouble, they will be there.
*B: If John don't want trouble, they be there.
- 33: I like hotdogs cause dey taste good.
A: I like hotdogs because they taste good.
*B: I like hotdogs cause dey taste good.
- 34: We will be traveling when it's summer.
A: We be traveling when it's summer.
*B: We will be traveling when it's summer.
- 35: If I were you, I would have Jack pay for the scraped fender.
A: If I's you, I be having Jack pay for the scraped fender.
*B: If I were you, I would have Jack pay for the scraped fender.
- 36: Some of the kids are riding in the Ford.
A: Some of the kids be ridin in de Ford.
*B: Some of the kids are riding in the Ford.

- 37: Dat stove don't be electric.
A: That stove isn't electric.
*B: Dat stove don't be electric.
- 38: What's the matter? Everytime I come looking for her,
she isn't at home.
A: What's da matter? Everytime I come lookin for
her, she don't be at home.
*B: What's the matter? Everytime I come looking for
her, she isn't at home.
- 39: No, I don't want any lunch. I'm not hungry now!
A: No, I don' want no lunch. I don' be hungry now!
*B: No, I don't want any lunch. I'm not hungry now!
- 40: We are going to the zoo.
A: We's goin to the zoo.
*B: We are going to the zoo.
- 41: My brudder be playin in de yard.
*A: My brudder be playin in de yard.
B: My brother is playing in the yard.
- 42: Der's a fire in de kitchen!
*A: Der's a fire in de kitchen!
B: There's a fire in the kitchen!
- 43: Ain't ya never on time?
*A: Ain't ya never on time?
B: Aren't you ever on time?
- 44: Hey Tom, what are you doing there?
*A: Hey Tom, what are you doing there?
B: Hey Tom, what chew doin der?
- 45: He isn't a mechanic. My car still doesn't run.
*A: He isn't a mechanic. My car still doesn't run.
B: He ain't no mechanic. My car still don't run.
- 46: Sorry mister, I don't know where those stores are.
A: Sorry mista, I don' know where dos stores is.
*B: Sorry mister, I don't know where those stores
are.

- 47: No Jack, we aren't going to the grocery store.
*A: No Jack, we aren't going to the grocery store.
B: No Jack, we ain't goin' to de grocery store.
- 48: We ain't never had such a good dance!
*A: We ain't never had such a good dance!
B: We have never had such a good dance!
- 49: I da know. Maybe tha's what she done.
A: I don't know. Maybe that's what she did.
*B: I da know. Maybe tha's what she done.
- 50: I've got to learn how to swim.
A: I gotta learn ta swim.
*B: I've got to learn how to swim.
- 51: Ya' seen our ballfield?
*A: Ya' seen our ballfield?
B: Have you seen our ballfield?
- 52: I did'n do it! I neva been der!
A: I didn't do it. I've never been there!
*B: I did'n do it! I neva been der!
- 53: Teacha, I ain't got no pencil.
*A: Teacha, I ain't got no pencil.
B: Miss Smith, I don't have a pencil.
- 54: We're going to talk about that movie.
A: We gonna talk about dat movie.
*B: We're going to talk about that movie.
- 55: Hey Bill, what do you mean by that?
*A: Hey Bill, what do you mean by that?
B: Hey Bill, what ya mean by dat?
- 56: All you're worrying about is the money.
*A: All you're worrying about is the money.
B: All you worrin' bout is de money.
- 57: We ain't talkin', Miss. Ain't nobody said nothin'.
A: We aren't talking, Miss Jones. Nobody said anything.
*B: We ain't talkin', Miss. Ain't nobody said nothin'.

- 58: When you late, you be in trouble.
*A: When you late, you be in trouble.
B: When you're late, you're in trouble.
- 59: What da ya think? It look like an old Plymouth.
A: What do you think? It looks like an old Plymouth.
*B: What da ya think? It look like an old Plymouth.
- 60: I don't like it. But ask Allen how he feels about it.
A: I don' like it. But ast Allen how do he feel 'bout it.
*B: I don't like it. But ask Allen how he feels about it.
- 61: Pizza and spaghetti is alright, but Jane like hotdogs instead.
A: Pizza and spaghetti are all right, but Jane likes hotdogs instead.
*B: Pizza and spaghetti is alright, but Jane like hotdogs instead.
- 62: You watch it! Your brain is going to break out of your head!
A: You watch it! You' brain gonna bust out you' head!
*B: You watch it! Your brain is going to break out of your head!
- 63: I asked my mother if I could go, but she said no.
*A: I asked my mother if I could go, but she said no.
B: I ast my mother could I go, but she says no.
- 64: We chase the dog out de house.
*A: We chase the dog out de house.
B: We chased the dog out of the house.
- 65: You mean in school you be restless?
A: Do you mean that in school you are restless?
*B: You mean in school you be restless?
- 66: This TV show is worse than that one.
*A: This TV show is worse than that one.
B: Dis TV show is worser dan dat one.

- 67: What chew doin'? Kin I help?
A: What are you doing? Can I help?
*B: What chew doin'? Kin I help?
- 68: All them football players is real good!
A: All of those football players are good!
*B: All them football players is real good!
- 69: I ast my girl ta go to the dance.
*A: I ast my girl ta go to the dance.
B: I asked my girl to go to the dance.
- 70: She's washing all of those dishes.
*A: She's washing all of those dishes.
B: She washin' all them dishes.

BIBLIOGRAPHY

- Corey, Stephen M. Action Research to Improve School Practices.
New York: Bureau of Publications, Teachers College, Columbia University, 1953.
- Gagné, Robert M. "Factors in Acquiring Knowledge of a Mathematical Task," Psychological Monographs, Vol. 76, No. 7, 1962.
- Guba, Egon G. "Evaluation and the New Media." Bureau of Educational Research and Service. Occasional Papers. Columbus: Ohio State University, 1967.
- Guba, Egon G. "Methodological Strategies for Educational Change." Paper presented to Conference on Strategies for Educational Change. Washington, D. C., 1965.
- Guba, Egon G. and David L. Clark. "An Examination of Potential Change Roles in Education." NEA-CSI Seminar on Innovation in Planning School Curricula. Aerie House, Virginia, October, 1965.
- Kershaw, J. A. and R. N. McKean. Systems Analysis and Education. Santa Monica: The Rand Corporation, October, 1959.
- Lewin, Kurt. "Principles of Re-education," Human Relations in Curriculum Change. New York: The Dryden Press, 1951.
- Lindvall, C. M. Testing and Evaluation: An Introduction. New York: Harcourt, Brace & World, Inc., 1961.
- Lippitt, Ronald, J. Watson, and B. Westley. The Dynamics of Planned Change. New York: Harcourt, Brace & World, Inc., 1958.
- Miles, Matthew B. "Planned Change and Organizational Health: Figure and Ground," Change Processes in the Public Schools. Eugene, Oregon: University of Oregon, 1965.
- Rogers, Carl. "Persons or Science?" The American Psychologist, Vol. 10, No. 7, 1955.
- Silvern, Leonard C. Administrative Factors Guide to Basic Analysis. Los Angeles: Education and Training Consultants, 1965.

- Stake, Robert. "The Countenance of Educational Evaluation,"
Teacher's College Record, Vol. 68, No. 7, 1967.
- Stufflebeam, Daniel L. "Depth Study of the Evaluation Requirement,"
Theory Into Practice, Vol. 5, No. 3, 1966.
- Stufflebeam, Daniel L. "The Use and Abuse of Evaluation in Title III,"
Theory Into Practice, Vol. 6, No. 3, 1967.
- Suchman, Edward A. Evaluative Research: Principles and Practice
in Public Service and Social Action Programs. New York: Russell
Sage Foundation, 1967.
- Tyler, Ralph W. Basic Principles of Curriculum and Instruction.
Chicago: University of Chicago Press, 1950.
- Wiener, Norman. Cybernetics. New York: John Wiley, 1948.